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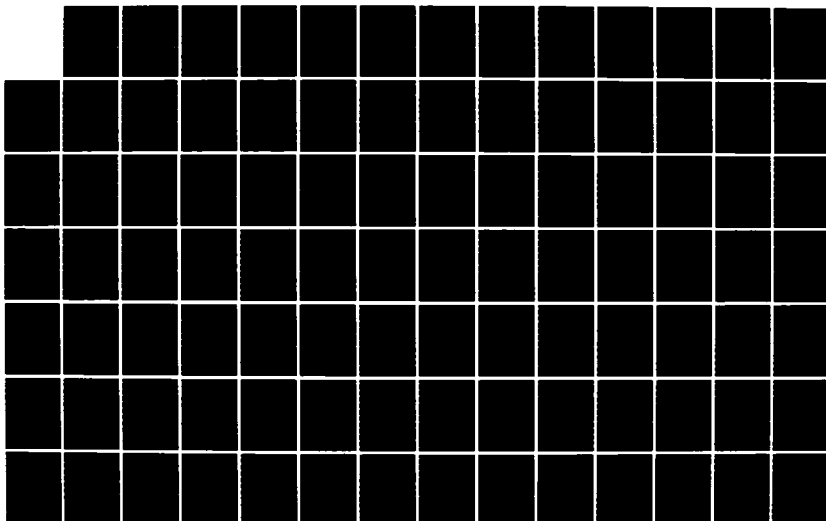
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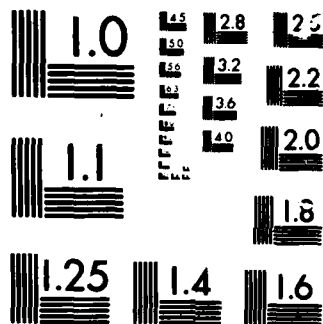
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MANAGERIAL ACTIVITY ANALYSIS VIA MINTZBERG'S ROLE THEORY:  
THE EFFECTS OF PERSON AND ORGANIZATION VARIABLES

(Publication No.                    )

Arthur Leo Rastetter, III, Ph.D.  
The Florida State University, 1985

Major Professor: William A. Shrode, D.B.A.

This research examined the contingency view of management using Mintzberg's role concept. A modified activity sampling methodology was used. Self-reported activities and interactions were mapped to one of eleven roles - Mintzberg's ten or a subordinate role.

The major research objectives were to test Adcock's modified activity sampling methodology to detect the role behavior of military managers, to verify that military managers act in all eleven roles, to determine the effect of selected organization and person variables and combined effects in how managers distribute their time in roles, and to detect differences between private and military managers regarding role behavior.

The methodology successfully detected role behavior. All eleven roles existed and the managers did not distribute their time in the roles uniformly.

Four organization variables had an effect on time in roles. Span of control affected the figurehead,



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leader, task leader, monitor, entrepreneur, and resource allocator roles. Hierarchical level affected the figurehead, leader, spokesman, and resource allocator roles and may have had a wider effect if it were not highly correlated with the number supervised. Number supervised affected the figurehead, monitor, and disturbance handler roles. Line/staff functional area affected the disseminator, entrepreneur, and resource allocator roles but was correlated with span of control.

The time distribution among roles was the same for both military and private sector managers.

The results for the person variables were disappointing. Need for achievement (n Ach) affected the leader, task leader, and disseminator roles. Leadership orientation affected time in the figurehead role but was highly correlated with span of control. Marginality did not affect any role; however, it was correlated with leadership orientation. The combined effect, n Ach/mid-level management, affected the entrepreneur and negotiator roles. Overall, the organization variables affected the roles to a much greater extent than the person variables.

This study verified that management is contingent upon the situation. Researchers must move forward and determine what situations require what roles and skills and which of these in particular situations lead to effective results. Practitioners then can better select

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managers for particular jobs. Together, systems of selection, appraisal, development, and promotion can be derived.

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THE FLORIDA STATE UNIVERSITY  
COLLEGE OF BUSINESS

MANAGERIAL ACTIVITY ANALYSIS VIA MINTZBERG'S ROLE THEORY:  
THE EFFECTS OF PERSON AND ORGANIZATION VARIABLES

by

ARTHUR LEO RASTETTER III

A Dissertation submitted to the Department of  
Management in partial fulfillment of the  
requirements for the degree of  
Doctor of Philosophy

Approved:

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Hayden  
Dean, College of Business

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December 1985

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## CHAPTER 1

### INTRODUCTION

With the publication of Henry Mintzberg's book, The Nature of Managerial Work, in 1973, researchers were provided with a theoretical basis for examining managerial behaviors (Chap 5). His book is based upon an intensive observation of the work activities of five chief executive officers (CEOs). As such, two key issues were raised: the first involved examining managerial activities, and the second concentrated on the observation methodology.

Mintzberg's contention is that one must concentrate on the manager's work content to explain what managers do. The classical concepts of planning, organizing, controlling, coordinating, and directing do not explain what managers do. Instead, these concepts are only vague objectives (1973, p. 10). The classical concepts fail in explaining the work of specific managers in specific jobs. Mintzberg's observation of the work activities of five CEOs led Mintzberg to the development of ten managerial roles (1973, p. 59).

Mintzberg believes that all managerial behavior can be explained using these roles. The roles are categorized into three groups: interpersonal, decisional, and informational roles. The interpersonal roles are the

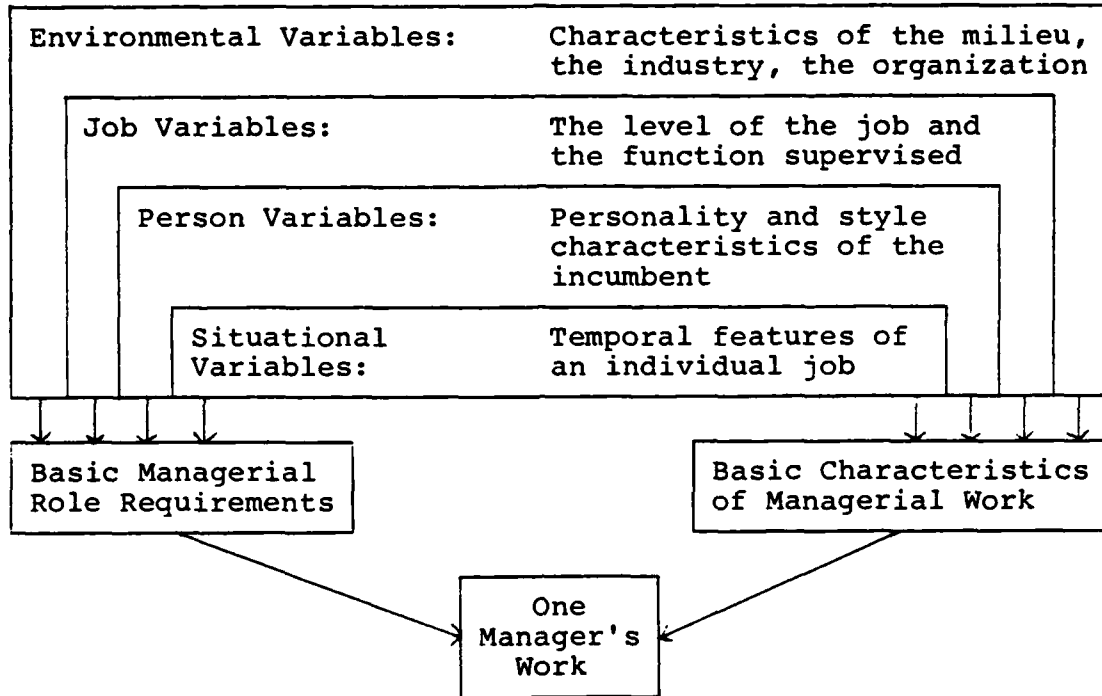
leader, liaison, and figurehead roles. The decisional roles consist of the entrepreneur, disturbance handler, resource allocator, and negotiator roles. Finally, managers act in the informational roles when they act as a monitor, disseminator, or spokesman (1973, p. 59). Additionally, all these roles are performed by all managers though at varying degrees. These variations can be explained using Mintzberg's Contingency View of Managerial Work. Such a view is presented in Figure 1. The work of a particular manager is determined by the effect of the four nested sets of variables on the basic managerial role requirements and on the basic characteristics of managerial work. The four nested sets of variables are environmental, job, person, and situational variables. This Contingency View and Mintzberg's ten roles have been the subject of much research to date. The other issue raised by Mintzberg's work is the use of observational research.

Mintzberg used a structured observation method to determine the activities in which his five CEOs engaged (1973, Appendix C). Mintzberg is a strong advocate of 'direct' research (1979). As will be discussed later, structured observation has both specific advantages and disadvantages; however, Mintzberg stated the point well:

. . . structured observation is an expensive research method but perhaps the only one that enables us to study systematically and comprehensively



Figure 1. Mintzberg's Contingency View of Managerial Work.



Note. From Mintzberg, 1973, p. 103.

those parts of managerial work that are not well understood. (1973, p. 228)

Obviously, the use of structure observation as a means of verifying Mintzberg's roles or his Contingency View would be a long and laborious process.

Adcock (1977) undertook the task of developing a method of more efficiently collecting data on managerial activities using the framework developed by Mintzberg (1973). Adcock's study proceeded in three phases (1973, p. 7). The first two phases directly related to developing an efficient method of collecting data on managerial activities within Mintzberg's role structure. The third

phase examined the effects of selected organizational variables on how managers distributed their time among the roles.

To develop an efficient method of sampling managerial activities using Mintzberg's role concept, it was imperative for Adcock to use Mintzberg's terminology as closely as possible. Thus, using Mintzberg's verbal contact categories, Adcock devised a method for mapping managerial activities and interactions onto the roles (1977, p. 87). This was a difficult task; and, at times, subjective decisions on mappings had to be made (p. 87). However, a managerial activities form was developed. The seven major categories of the form related closely to Mintzberg's verbal contact purposes. The seven categories were information, requests, reviews, strategy, negotiation, personnel administration, and ceremony. Besides the seven activity categories, the form included a who/what category. This form based on Mintzberg's verbal contact purposes then provided both the ability to map activities to roles and an efficient method of doing so.

While Mintzberg (1973) used an observational technique, Adcock's managerial activity form allowed Adcock to use an efficient, modified activity sampling method of self-reporting. Participating managers were each given a telephone pocket pager and a supply of managerial activity forms. When a manager's pager signaled him, he then

completed the form indicating who he was with and what he was doing. He then selected one of the seven major categories (information, requests, review, strategy, negotiation, personnel administration, or ceremony) and provided more detailed information on his activities and interactions at the moment he was signaled. Each form was then mapped to a particular role (Adcock, 1977, p. 112-124).

Phase II of Adcock's study consisted of using the managerial activity form to collect data from practicing managers. His effort was successful from both a validity and reliability perspective (p. 201-215).

In his final phase, Adcock examined the effect of four different organizational variables on how managers distributed their time among the roles. The four variables were hierarchical level, span of control, number supervised, and line versus staff function. Adcock found that hierarchical level explained more variation than any other organizational variable (p. 284-295).

This study was undertaken to further examine and expand upon the works of both Mintzberg (1973) and Adcock (1977). The central focus was on whether government/military managers engaged in all ten roles and if selected organization and person variables explained the variation in how government managers distributed their time among the

roles. The methodology used was the modified activity sampling devised by Adcock (1977).

#### PURPOSE OF STUDY

As discussed above, Mintzberg (1973) proposed his role concept of managerial activity. Adcock (1977) then operationalized this concept within his own conceptual framework to (1) determine if managers performed the roles Mintzberg hypothesized and (2) examine the effects of specific organization variables on the amount of time managers spend in each role. Using the previous work as a baseline, this effort strove to attain the following three Research Objectives and Subobjectives:

1. To test Adcock's modified activity sampling methodology to detect the role behavior of practicing government/military managers.
  - a. To verify that government/military managers do act in all eleven (Mintzberg's ten and Adcock's subordinate role) and to estimate the proportion of time spent in each role and thus verify that Adcock's methodology detects all eleven roles.
  - b. To determine the contribution of four organization variables examined by Adcock to the variability in how the government/military managers distribute their time in roles.
2. To detect differences between private (Adcock's sample) and government/military managers regarding their role behavior.
3. To determine the contribution of selected organization variables, person variables, and combined effects to the total variability in how government/military managers distribute their time in roles.

Mintzberg's roles and Adcock's methodology provided an excellent means for achieving Objective Three. The specific organization variables examined in accomplishing Objective Three were those used in Adcock's research. A complete replication of Adcock's work accomplished Objective One and its Subobjectives. A comparison of the results of the two studies accomplished Objective Two.

#### JUSTIFICATION

Before Mintzberg's role concept can be accepted, more research must be performed, especially since Mintzberg only examined five CEOs. Adcock improved on this first study by developing a method of operationalizing Mintzberg's roles and by examining lower- and middle-level managers. Adcock's study gave credence to the Mintzberg role concept. However, the results are still not generalizable since Adcock only studied a single organization and Mintzberg (1973) only studied CEOs. This study expanded on Adcock's study and fully replicated it. Also, to date, no study has been found that has examined the effects of person variables on how managers allocate their time among Mintzberg's roles and only one study has been found (Williams, 1969) that even looked at the effect of a person variable on which activities managers elected. Thus, this particular aspect of Mintzberg's view remains unexplored. Though many studies have been done examining

Mintzberg's Contingency View of Managerial Work and, specifically, the effect of organization and job variables on that work (Adcock, 1977; Alexander, 1979; Bristol, 1979; Lau, Newman, and Broedling, 1980; McCall and Segrist, 1980; Pavett and Lau, 1983; Whitely, 1978), no work has examined the effect of any person variables. This was an obvious next step as advocated by Adcock (1977), Alexander (1979), and Whitely (1978). To the extent that this research added knowledge about Mintzberg's role concept and the effect of person variables on that behavior, this research was justified.

Because this study builds on Adcock's work, it also lays the foundation for further research. As evidence is gathered through various studies to further support or refute Mintzberg's role theory, other studies can examine the combined effects between organization, technical, and person variables on how managers distribute their time among the roles.

Further, knowledge about how managers spend their time would be valuable to researchers and managers alike. It is a well documented fact that managers do not know exactly how they spend their time; and when asked to recall the amount of time they spend in certain activities, they consistently misjudge (Lewis and Dahl, 1976; Ley, 1978; McCall, 1978; Vorwerk, 1979). Thus, methodologies that capture actual data while being performed can improve

upon the knowledge in this area. Another key factor is the determination of whether or not managers control their work.

General agreement seems to exist that managers over estimate the amount of control they have over their time (Stewart, 1976). Likewise, some believe that managers have little control over their work activities which are primarily determined by the job (Mintzberg, 1973; Carlson, 1951). McCall (1978) summarized:

The impression is that managers perform a set of functions that is essentially responsive to the requests of others and to the requirements of the job itself. It may be that managers, particularly at higher levels, can and do create opportunities through or between their job commitments. Or it may be that the perception of having control is an illusion. (p. 19)

Thus, just how much control a manager has is an unresolved issue that has important implications.

With valid data on managerial activities and information on what affects the amount of control managers have, organizations can better manage themselves. Specifically, training programs could be better geared toward organizational needs. Managers could be trained not only on general responsibilities but also on specific activities such as handling two-minute interactions, using staff assistants and consultants, and delegating in an oral environment. Job rotations as a training device could be used not between functional areas but between jobs consisting of different activities. Likewise, exact knowledge of the

skills required at various hierarchical levels could aid in preparing managers for advancement. Lastly, knowledge of the skills required in a position would allow a better selection of an individual with specific skills, abilities, etc. for that position. Thus, this research is justified for two basic reasons. First, the research advances the theory of management by examining Mintzberg's role concept and the effect of person variables as part of a Model of Organizational Behavior. Second, this research and that upon which it builds may eventually provide a tool for analyzing managerial behavior and thus allow better designing of organizational structure and jobs and better matching of jobs and personnel.

#### SCOPE AND LIMITATIONS OF THE STUDY

This study examined a government/military organization using the methodology and management activities form developed by Adcock (1977). Thus, the results apply to that organization and similar organizations but are not generalizable beyond them. However, it is hoped that further replications in other organizations will lead to valid generalizations.

A specific set of person variables were examined. These variables included individual leadership orientation, marginality, and need for achievement. Of these three variables, only leadership orientation has been examined



regarding managerial activity. This study proposed as a result of reviewing the literature certain hypotheses about how these variables affect managerial behavior.

This study also examined the same hypotheses examined by Adcock (1977, p. 132-147). Thus, Adcock's research was fully replicated. The results then were compared to Adcock's results. Specifically, the effects of four organizational variables were examined: hierarchical level, line versus staff, span of control, and size of unit supervised.

This research in no way attempted to make any judgments or draw any conclusions about either the efficiency or effectiveness of the sample organization of the managers. Like Adcock's research, this research was exploratory: looking simply at the role behavior of the subjects and how they allocate their time to roles.

This research was based on the assumption that Adcock's management activities form is totally exhaustive, i.e., it includes all work related activities that a manager could engage in. It assumed that Adcock's form and methodology, as used here, properly map activities onto the 11 roles.

This research also assumed that subjects can better classify their activities than can an observer. The subject is better equipped to determine the activities in which he is engaged and the reason behind those activities.

As with any methodology using self-reporting, perceptions constitute a limitation. The respondents, in completing the form, record what they believe they are doing and not necessarily exactly what they are doing. Responses are subject to biases of different types. This was minimized in several ways. First, Adcock developed his form using non-sensitive terms. This diminished the bias potential. A large number of random samples per participant was taken over a two week period. This minimized the respondent's ability to recall previous responses. Lastly, the respondents were guaranteed complete anonymity.

#### METHODOLOGY

The overall methodology in this research was the same used by Adcock. Adcock's management activities form and modified activity sampling procedures were used. The major methodological addition of this study was in measuring the three person variables: need for achievement, leadership orientation, and marginality. Also, the organization sampled was a military organization. A military organization was chosen for several reasons. First, this organization - a service one - expands Adcock's work which was done in a private organization. Second, this researcher is in the United States Air Force and worked for three years in an organization similar to

the one studied. This experience combined with the fact that the researcher was granted access to the organization studied contributed to the selection of the military organization.

### Sample

A United States Air Force (USAF) Air Logistics Center (ALC) was sampled. There are five ALCs in the USAF. These organizations are very large - approximately 16,000 people each - and manage major military weapon systems. Consequently, managerial requirements run the gamut from technical to institutional with foremen to a commanding major general. Under the command section, there are generally five directorates, two of which provided respondents. The Directorate of Maintenance provided primarily line managers while the Directorate of Materiel Management provided staff managers. The sample included individuals from various hierarchical levels within the organization. This sample expanded on the Mintzberg study and the Adcock study. While Mintzberg only sampled CEOs and Adcock sampled middle- and lower-level managers, this study involved all levels. Also, while Mintzberg's work primarily involved private organizations and Adcock sampled a private organization, this study looked at a military organization.

To sample the managers' activities, each subject was given management activities forms for use during a

three week sampling period. This period was carefully chosen to insure it was a typical period of organizational activity and that no unusual events were occurring. Each respondent was also given a telephone pocket pager for the period. Each minute of the work day a respondent was signaled. At that time, the respondent completed the form. Each subject was signaled two to three times per hour on the average. The completed forms were processed and each mapped onto a role. This data was subjected to statistical analyses.

#### Data Collection

Standardized tests were used to categorize individuals within the person variables. These tests were administered at an orientation meeting where the purpose and procedures of the experiment were fully explained. To measure marginality, Ziller's Self-other Orientation Measure was used. Fiedler's Least Preferred Coworker Measure was used to measure leadership orientation, and need for achievement was measured using the Adjective Check List. Standard, valid, reliable instruments were chosen.

The data on managerial activities was collected using the modified activity sampling procedures developed by Adcock. This method is better than other methods for several reasons. First, the data collected is based on behavioral samples and not perceptions which are captured by interviews and questionnaires. Second, the method

has the advantage over observation in that there is no danger of an observer misinterpreting what the subject is doing. The respondent identifies his activities. Third, modified activity sampling is efficient when compared to observation since more data can be collected in a period of time. Thus, Adcock's modified activity sampling is more efficient than observation and eliminates the danger of observer misinterpretation.

### Hypotheses

As has been indicated, this research was based on Mintzberg's Contingency View and Adcock's work. As such, the following Research Hypotheses were proposed:

1a. Military/government managers do act in all 11 roles though at different levels due to the effect of certain variables.

1b. Organization variables affect how managers distribute their time among roles.

(1) Hierarchical level will affect time in the figurehead, disturbance handler, and negotiator roles.

(2) Span of control will affect time in the leader, disseminator, resource allocator, and disturbance handler roles.

(3) Line versus staff will affect time in the disturbance handler, negotiator, monitor, disseminator, and spokesman roles.

(4) Size of unit supervised will affect time in the disseminator, disturbance handler, and leader roles.

2. Private managers (using Adcock's sample) will distribute their time among the roles differently than military/government managers.

3. Person variables will affect how managers distribute their time among roles.

a. Leadership orientation will affect time in the disseminator and leader roles.

b. Need for achievement will affect time in the entrepreneur and negotiator roles.

c. Marginality will affect time in the monitor, disturbance handler, and resource allocator roles.

#### CHAPTER ARRANGEMENT

Chapter 1 is the basic introduction to this research. It consists of the background or bases of this study, the purpose of the study, the justification, the study's scope and limitations, and finally a review of the methodology.

Chapter 2 consists of an extensive review of the literature pertinent to this dissertation. Mintzberg's work is discussed as well as follow-on studies stemming from Mintzberg's work. Adcock's dissertation is reviewed. General literature relative to the advantages and disadvantages

tages of various data gathering techniques is discussed. Finally, the literature providing the bases for hypotheses concerning the organization and person variables is discussed.

Chapter 3 presents the details of the methodology. This includes the research model and hypotheses. The details of the data collection and analyses procedures are discussed.

Chapter 4 presents the data collected and the specific statistical results obtained from that data. Major findings are presented.

Finally, Chapter 5 summarizes the dissertation effort, emphasizes major findings and conclusions, and recommends areas for further research.

## CHAPTER 2

### LITERATURE REVIEW

The basis of this entire study is Mintzberg's (1973) work on managerial roles. Thus, his work is reviewed first. Mintzberg's work led to a number of studies that examined or used his role concept. In reviewing those post-Mintzberg studies, one finds that our knowledge of managerial roles has not progressed very far. Mintzberg argued strongly that actual managerial activities must be studied directly. Unfortunately, most of the post-Mintzberg studies instead examined perceptions of Mintzberg's role concept using questionnaires rather than examining actual managerial activities. Thus, today, there is very little empirical knowledge on Mintzberg's role concept.

Mintzberg's role concept is presented within his Contingency View of Managerial Work which emphasizes the effects of environmental, job, person, and situational variables on managerial work (1973, p. 103). Four organizational variables - line versus staff, hierarchical level, span of control, and size of unit supervised - are of central interest to the study of management. Organizational variables, and in particular these four variables, have been theorized to affect organizational behavior for years. Kast and Rosenzweig (1970), Seiler



(1967), Campbell et al (1970), and Mintzberg (1973) have all supported the notion that organization variables affect managerial behavior. However, the findings from empirical research are not totally consistent on the effect of these variables upon managerial activity. The research on the effect of hierarchical level is the strongest and most consistent. As one proceeds up the hierarchy, different skills and behaviors exist than at lower levels. But for the other three there is very little empirical research that examined actual managerial activity.

Just as theory supports the effect of organizational variables on managerial behavior, so does it support the effect of person variables. Researchers started examining the effect of personal variables after Elton Mayo's discoveries at Western Electric (Wren, 1979, p. 299-312). Kast and Rosenzweig (1970), Seiler (1967), Campbell et al (1970), and Mintzberg (1973) also provided theoretical support for the effect of person variables upon managerial activity. Of particular interest to management scholars are leadership, need for achievement (n Ach), and marginality. There is no generally accepted theory of leadership though many theories exist. Likewise the concept of motivation is accepted, but no universal theory of motivation has been accepted. The need theory, of which n Ach is one motivator, has been researched for some time. Very little research examining various leadership or motivation

theories and actual managerial activities exists to date. Marginality is based in social-psychological theory of personality and is believed to predispose individuals to specific types of activities. In particular, one can expect a marginal individual to be particularly suited to particular jobs (Ziller, 1973). Though this fact has been supported to some extent, there is little research that has examined whether marginal managers tend to engage in particular managerial activities. Thus, very little empirical literature exists which examines the effects of person variables on actual managerial behaviors.

The literature on managerial activity in the public versus private sectors is also blurred. First, there is no agreement on the precise definition of the two terms. Second, some theorists have argued that managerial activities in the two sectors must be different by definition. However, others argue that there is little difference and that a generic theory of management can be developed for the two sectors. As with the research on organization and person variables, little research exists that actually compares managerial activities in the two sectors. That which does exist tends to find only minor differences, if any.

The final part of the literature review focused on Adcock's (1977) study. This study provided the theoretical framework and methodology used in this study.

Adcock successfully developed a method of mapping managerial activities to Mintzberg's roles. This accomplishment permits the efficient examination of Mintzberg's role concept.

#### MINTZBERG'S STUDY

Mintzberg took the approach that much of the literature on management was lacking. He undertook the study of five CEOs using a structured observation methodology to uncover the purposes behind managers' behaviors. After studying the detailed data collected over a five week period, Mintzberg inductively derived the ten roles discussed in the previous chapter as being common to all managerial activity.

The five CEOs studied were from various types of organizations. One manager was the chairman and chief executive officer of a major consulting firm. The next was an engineer now president of an organization performing research and development and producing high technology products for industry and defense. The third CEO headed a large urban hospital. The fourth CEO was president of a firm producing consumer foods in a highly competitive industry. The last CEO was the superintendent of a large suburban school system (Mintzberg, 1973, p. 239).

In preparing for the study of the CEOs, Mintzberg first collected some preliminary information. For each,

he collected one month of scheduled appointments, information about the organization, and information about the manager. During the observation period, three data records were maintained. These were the chronology record cross-referenced to the other two records: the mail record and the contact record (p. 232).

The analysis of the chronology record - simply a chronological record of each CEO's activities - revealed five major types of activities based upon the observation of 547 distinct activities. These were desk work, telephone calls, scheduled meetings, unscheduled meetings, and tours (p. 240).

Six hundred fifty-nine pieces of incoming mail were reviewed. Mintzberg categorized the purposes behind the correspondence into twelve categories: acknowledgements, status requests, solicitations, authority requests, reference data, general reports, periodical news, events, reports on operations, advice on situations, problems and pressures, and ideas. Two hundred thirty-one pieces of outgoing correspondence were examined. Nine purpose categories were uncovered: acknowledge input, reply to written request, reply to information received, forward information to subordinate, forward request to subordinate, write to third party reference an input, acknowledge or reply to verbal contact, write report, and originate latter or memo (p. 241-248).

Mintzberg's review of the contact record yielded thirteen categories that described the purpose behind managerial activities. These were nonmanagerial work, scheduling, ceremony, external board work, status requests and solicitations, action requests, manager requests, observational tours, receiving information, giving information, review, strategy, and negotiation (p. 249-257).

Finally, through intuitive reasoning, Mintzberg reviewed his data and derived 10 roles he believed all managers perform. These roles consist of the interpersonal roles of figurehead, leader, and liaison. The informational roles consist of monitor, disseminator, and spokesman. The decisional roles are entrepreneur, disturbance handler, resource allocator, and negotiator.

#### POST MINTZBERG STUDIES

Many studies have been undertaken to examine managerial behavior in light of Mintzberg's role concept. Likewise, a few have used his Contingency View of Management to examine the effects of different variables on how managers allocate their time to different roles or activities. A review of the literature indicated that many of the studies performed had been done in the educational area. Since this research and its predecessor (Adcock, 1977) dealt with business and military/government managers, the studies in the educational area were not discussed.

Though many studies have examined Mintzberg's role concept, some have used questionnaires which examined only perceptions. These were not discussed since this study was based on behaviors and not perceptions. Thus, the only post Mintzberg studies reported were those using an observational or activity sampling methodology in a non-educational setting.

#### Ley Study

Ley (1978) examined the managerial work of seven managers in the hotel industry using a structured observation methodology. His study used preliminary data, data collected during the observation period, and anecdotal data obtained by asking questions. Each manager was observed for three days. Additionally, Ley asked the respondents to rate the importance of each of Mintzberg's ten roles as well as to estimate the time spent in each role (p. 72-75).

This study was an attempt to examine Mintzberg's Theory at a middle management level. Ley concluded that Mintzberg's roles were substantiated in his study (p. 178).

#### Scott Study

Scott (1983) undertook the study of two middle-level managers in her research. She examined the managerial activities of a public education manager and a public service manager, both middle-level managers, using a

modified-Mintzberg type structured observation methodology based on the work of Martinko and Gardner (no date). She hypothesized that "There will be no significant difference in the frequency of activities a public education manager and a public service manager spend in each of Mintzberg's roles" (p. 45). She also hypothesized that "There will be no significant difference in the percentage of time a public education manager and a public service manager spend in each of Mintzberg's roles" (p. 48). Each manager was observed for five days. She also compared actual time spent in each role to the time the managers reported they spent in each role.

Scott's results were mixed. She found a significant difference between the managers on the frequency of observations in each role but no significant difference on the percentage of time in each role (p. 45-50). Neither manager was successful in accurately estimating the time spent in each role (p. 54). These were the only two observational/activity sampling studies - other than Adcock's study (1977) - accomplished to examine Mintzberg's role theory outside of the education field.

#### ORGANIZATION VARIABLES

Throughout management studies, research, and theory, organization variables appear. Cummings and Berger (1976) pointed out that seven organization variables

frequently appear in the literature. These included hierarchical level, line versus staff, span of control, unit size, organizational size, the total number of hierarchical levels in an organization, and centralization versus decentralization of decision making. Kastz and Rosenzweig indicated that organizational variables impact the role expectations of managers (1970, p. 263). Seiler developed an input-output model of human behavior in which input variables cause actual behavior. One of the input variables was organizational which included salary levels, procedures, incentive systems, and the style of leadership rewarded (1967, p. 25-27). Campbell et al (1970) developed a contingency model of managerial behavior. The model theorized that both environmental and situational characteristics determine behavior. Some of these characteristics included organization size, number of hierarchical levels, formal power, and procedural rules. Campbell et al further drew upon the work of Porter and Lawler to specify certain variables that affect behavior. The variables included hierarchical level, line versus staff, span of control, and size of unit (p. 386). The four organization variables examined in this research were hierarchical level, line versus staff, span of control, and number supervised. Each of these variables is discussed below.



### Hierarchical Level

As stated above, theory proposes that organization variables affect managerial behaviors. Campbell et al (1970) theorized that hierarchical level would affect managerial behavior. The theoretical base for hierarchical level affecting managerial behavior goes back to Fayol who simply stated that as one moves to a higher level one's need for managerial ability increases while one's need for technical ability decreases (1916, p. 9). Likewise, Katz (1955) emphasized the effect of hierarchical level on managerial behavior. He emphasized the need for technical skills at lower organizational levels and conceptual skills at higher levels. Tosi and Carroll (1976) stated that three hierarchical levels existed: top, middle, and lower. Top-level managers are required to primarily examine the environment and to determine how the organization should cope with the environment. Middle-level managers should primarily determine how to implement policy set by top-level managers. Finally, the lower-level managers must ensure that lower-level employees carry out the required work plans. Steiner and Miner (1977) stated that two types of management exist in an organization: strategic and operational. Table 1 delineates the differences.

Though theory exists on hierarchical level and managerial behavior, there is very little empirical research examining

Table 1

## Key Differences between Strategic and Operational Management

Criteria	Strategic Management	Operational Management
Level of conduct	Top Management	Middle- and lower-level management
Point of view	Corporate	Functional or departmental
Focus	Overall well-being	Day to day operations
Time horizon	Long term	Short term
Nature of problems	Unstructured; one of a kind	Structured; repetitive in nature
Level of ambiguity	High; dealing with many uncertainties	Low; dealing with more certain tasks
Information needs	Largely from outside the organization	Largely from inside the organization
Range of alternatives	Numerous	Limited
Evaluation of outcome	May only become evident after a	Often quickly evident after taking action
Importance	The highest importance to the organization	Considerably less significant to the organization
Amount of detail	Concerns broad implications with few details	Often concerns specific details of operations

Note. From Steiner and Minter, 1977, p. 22-24.

hierarchical level and managerial behaviors relevant to this study. Cummings and Berger performed a literature review on hierarchical level and concluded that there is little evidence that hierarchical level affects behavior (1976, p. 47).

Mintzberg (1973) proposed that hierarchical level would affect managerial behavior. Specifically, he stated that lower-level managers would spend more time in the combination disturbance handler and the negotiator roles since they deal with more day to day operational problems while higher-level managers would spend more time in the figurehead role (1973, p. 130). Adcock's research contradicted Mintzberg's proposition on the combination disturbance handler and negotiator roles but found higher-level managers to spend more time in the figurehead role. When examining the disturbance handler and negotiator roles individually, Adcock found no relationship between them and hierarchical level (1977, p. 245, 271).

Though Adcock made no hypotheses regarding hierarchical level and the resource allocator role, he did find a significant relationship. He found that higher-level managers spent more time in this role than did lower-level managers (1977, p. 261).

Vorwerk (1979) found that very little data existed on what managers and in particular public sector managers do; thus, he undertook his study. His study set out to determine how the managers spent their time, who they spent it with, who initiated contacts, etc. His study also compared the work activities of public and private sector managerial behavior (p. 4-9). Since his study

did examine hierarchical level, it was included in this literature review.

Vorwerk (1979) studied the managerial activities of 24 municipal managers in a southwestern city of approximately 300,000. Using activity sampling, Vorwerk collected data on the activities of the managers using an Extensor unit. This is a desk top unit that randomly signals the manager who then records his activities. Unfortunately then, only office work is sampled since the unit is not portable. Vorwerk did examine the effects of hierarchical level on managerial activities; however, he did not explicitly use Mintzberg's roles in his study. One activity examined was negotiating. He found no significant difference in negotiating due to hierarchical level. Vorwerk examined a category named the supervisory role. He did find a significant difference in management time allocation for this role with higher-level managers spending more time in this role than lower-level managers (1979, p. 125).

Alexander (1979) examined the effect of hierarchical level on Mintzberg's roles. The theoretical basis of his study was contingency theory. Specifically, his work was based on that of Burns (1957), Hemphill (1960), Sayles (1964), Aguilar (1967), Stewart (1967, 1976), and Mintzberg (1973). Alexander set out to empirically determine the perceived effect of both hierarchical level and functional area on managerial behavior. However, Alexander's

study collected data using a questionnaire rather than observation or activity sampling. Alexander sampled 225 managers from the private sector in southern California (1979, p. 45) representing three levels of management and three functional areas: production/manufacturing, sales/marketing, and accounting/finance. His questionnaire described each role and asked each manager to rate - using a five point Likert scale - the degree that each role is required (p. 136-139).

Alexander developed and tested four hypotheses relating to hierarchical level, two of which were relevant to this study (p. 30). First, Alexander hypothesized that strategic management roles (monitor, entrepreneur, and resource allocator) are required more at higher levels of management than lower. This hypothesis was supported (p. 51-55).

He then hypothesized that operational management roles (leader, disseminator, and disturbance handler) are required more at lower levels of management (p. 32-33). This hypothesis was not supported (p. 55). Some additional findings regarding hierarchy were found however (p. 62-63).

Specifically, Alexander found that higher-level managers perceived that they required the figurehead, liaison, monitor, disseminator, spokesman, and entrepreneur roles more than the lower-level managers. However, middle-level managers reported the higher requirement

for the negotiator role. On an individual basis, there were no significant findings for the leader, disturbance handler, or resource allocator roles (p. 62-63).

McCall and Segrist (1980) using Mintzberg's Contingency View as a basis examined the effects of hierarchical level on managerial behavior. As did Alexander (1979), they developed a questionnaire for their work. They measured 'perceived importance' on a 7-point Likert scale (1980, p. 5) rather than actual behaviors. A total of 2,609 surveys were returned from a large manufacturing organization and analyzed. After subjecting the responses to a factor analysis, McCall and Segrist concluded that they had successfully operationalized the leader, liaison, monitor, spokesman, entrepreneur, and resource allocator roles (p. 6). McCall and Segrist found that higher-level managers rated the liaison, entrepreneur, resource allocator, and monitor roles more important than did the lower-level managers (p. 9-10).

Pavett and Lau (1983) continued the work of McCall and Segrist (1980). They examined the perceived importance of Mintzberg's roles in a sample of 180 managers in private sector service and manufacturing firms in southern California. The sample included CEOs, middle-level managers and lower-level managers (p. 171). They found a significant difference between top- and lower-level managers on eight roles.

Top-level managers rated the figurehead, liaison, monitor, disseminator, spokesman, resource allocator, and negotiator roles as significantly more important. The lower-level managers rated only the leader role as more important. In comparing the results for the middle- and lower-level managers, the lower-level managers rated leader role as more important while the middle-level managers rated the figurehead, monitor, disseminator, resource allocator, and negotiator roles as more important. Finally, the top-level managers rated the resource allocator role more importantly than did the middle-level managers (1983, p. 173).

A solid theoretical basis exists for stating that hierarchical level affects managerial activity. Campbell et al (1970) included hierarchical level in the Contingency Model of Managerial Behavior. Mintzberg (1973) proposed that hierarchical level would affect how managers act. The impact of hierarchical level can be seen in the works of Fayol (1916), Katz (1955), and Tosi and Carroll (1976). A few empirical studies exist.

Adcock (1977) found that hierarchical level affected managerial behavior more than any of the other organizational variables he examined. Likewise, Vorwerk (1979) using an Extensor unit sampled managerial behavior and found that hierarchical level affected managerial activity. Besides these two studies which examined managerial

behavior, other studies exist that examined managerial perceptions of the effect of hierarchical level on managerial activity using Mintzberg's roles.

Alexander (1979) developed a questionnaire to examine the perceived effect of two organizational variables on how managers distributed their time among Mintzberg's roles. He found that an effect did exist. McCall and Segrist (1980) and Pavett and Lau (1983) also used questionnaires to examine managers' perceptions of how hierarchical level affected the time in Mintzberg's roles.

The specific results of these studies were inconclusive. One cannot say that hierarchical level definitely affects time in specific roles. However, each study did find an effect between hierarchical level and managerial activity.

#### Line versus Staff

Theory has stipulated that functional area is a contingency factor in management. This theory can be traced back to Max Weber (1947) who argued that managers in different functional areas develop different areas of expertise through the required division of labor. Parsons (1960) divided managerial work into three functional areas: managerial, institution, and technical systems. Katz and Kahn (1966) divided the organization into the subsystems of production, maintenance, boundary procurement and disposal, adaptive, and managerial. Finally, both



Stewart (1967) and Pheysey (1972) theorized and found that staff managers have their own unique requirements. Mintzberg presented his own views on the effect of functional areas on managerial activity.

Since Mintzberg believed that line managers are more oriented toward operational problems, he proposed that they would spend more time in the combination disturbance handler and negotiator roles than would staff managers (1973, p. 130-131). Adcock found just the opposite to be true when examining the combination (1977, p. 245). However, when Adcock looked at each of the roles individually, no relationship was uncovered.

Mintzberg also proposed that the staff spends more time in the informational roles due to the nature of staff work (1977, p. 131). Adcock's results contradicted this proposition since he found line managers to spend more time in the combination of these roles (p. 245). When Adcock examined each role separately, he found no significant relationships (p. 245, 271).

Alexander's work (1979) was based on contingency theory which states that both hierarchical level and functional area affect managerial behavior. In his study, he tested several hypotheses relating to the effect of functional area on how managers distribute their time among Mintzberg's roles (1979, p. 31). Two hypotheses could be related to this study if one substitutes the

word 'line' for 'production'. He hypothesized that production managers would require the decisional roles more than the interpersonal or informational roles while sales managers would require the interpersonal roles more than the decisional or informational roles (p. 36). Alexander's results generally supported both the hypotheses (p. 67-72).

McCall and Segrist (1980) also found some results regarding function. They found that top-level and lower-level managers in manufacturing (line) rated the leader, entrepreneur, and resource allocator roles more important than others though the middle-level managers did not (p. 9).

Pavett and Lau (1983) also examined the differences between functional managers in rating the importance of Mintzberg's roles. The functional areas included in the questionnaire study included sales/marketing, production/engineering (comparable to this study's line), accounting/finance, research and development, personnel, and general managers (comparable to this study's staff). The only finding relative to this study is that the general managers rated the monitor role more important than did the production/engineering managers (p. 174).

The cited studies support the theory that functional area, in this study line versus staff, affects managerial

activity. Again, as with hierarchical level, different studies do provide some differing effects.

### Span of Control

As Cummings and Berger (1976) pointed out, span of control has been studied extensively in management theory as an important organizational variable in the practice of management. Even the ancient Egyptians acknowledged the importance with what appeared to be their 'rule of ten' (Wren, 1979, p. 19). Fayol included organizing as one of his elements of management. Under this element, Fayol's administrative theory of management discussed span of control. Fayol (1916, p. 98) believed that foremen should manage no more than 15 workers and that there should be a superior for every four managers.

Later, as social considerations were added to the theory of management, Dennison (1931) proposed that the span of control should usually be in the range of six to twelve. During this same period, Graicunas examined span of control. Graicunas believed that industrial managers had to supervise too many subordinates. He believed that man could mentally only handle so much at one time. Thus, he believed the span of control should be narrow. He developed a mathematical formula to support his argument that a manager's span of control should be four or five at the most (Wren, 1979, p. 386-387). As times progressed, opinions changed.

Chris Argyris (1957) argued that many of the practices that evolved from scientific management principles and the theory of administrative management actually were detrimental to the practice of management. His position was that the formal organization actually kept individuals from self-actualizing and in fact treated them as immature. A particular contributing factor to this state was a small span of control which allowed superiors to exercise closer control on subordinates and thus keep them under control. This theoretical history of span of control led to Adcock's hypotheses on this variable.

Mintzberg developed no propositions regarding span of control; however, Adcock did though he based his hypotheses on intuitive reasoning. He argued that as the span of control increased, so did the manager's status and required administrative duties. This would thus require more time in the leader role. The increased span of control would also require a manager to spend more time disseminating information. Adcock argued that the larger span of control would require a manager to spend more time allocating resources as subordinates competed for the resources. Finally, as the span of control increased, Adcock argued that conflicts and disturbances would be more likely to occur. Thus he argued that managers with larger spans of control would spend more time in the combination leader, disseminator, resource allocator, and

disturbance handler roles (1977, p. 137-139). His results supported this hypothesis when looking at the combination of these roles (p. 245). When examining each of the above roles individually, Adcock found no relationship to span of control.

Though Alexander (1979) offered no hypotheses regarding span of control, he did have findings in this area. He found that managers with medium spans of control (four to eight) perceived a greater requirement for the liaison, monitor, disseminator, and spokesman roles than did others while those with the widest span of control required these roles the least (p. 111-112, 116).

Span of control has been a factor of management theory since at least the early Egyptian times. Scientific and administrative management theory argued for a small span of control while theorists such as Argyris (1957) believed that small spans of control can be detrimental to organizations.

#### Number Supervised

The number supervised, or size (Glisson and Martin, 1980, p. 24), is an organizational variable that has been tied with span of control (Fayol, 1916; Mintzberg, 1980). Likewise, size is related to such issues as the degree of centralization and the number of hierarchical levels in an organization. Pugh et al (1969) and Blau (1970) have examined size and centralization and determined

that larger size yields more centralization. Size has been examined regarding such issues as performance (Fiedler and Gillo, 1974; Indik and Seashore, 1961), incidence/duration of strikes (Walton and McKersie, 1965; Porter and Lawler, 1965; Eisele, 1974), and absenteeism/turnover (Porter and Lawler, 1965; Woodward, 1965; Ronan and Prien, 1973). Only Adcock (1977) has actually examined the relationship between behavior and size.

Adcock found a significant relationship between the total number supervised and the disturbance handler role. As size increased, time in the role increased (1977, p. 262). Though Adcock hypothesized that time in the disseminator role would increase with the number supervised, his results did not support this hypothesis. Likewise, Adcock's hypothesis that time in the leader role would increase with the number supervised was not supported. Similarly, Adcock's hypothesis that as the number supervised increased, time in the resource allocator role increased was not supported (p. 245).

Cummings and Berger conducted a review of the literature on the effect of subunit size on managerial behavior and attitudes and concluded that the literature does not support any effect of this variable on behavior (1976, p. 47).

Again, the evidence is conflicting. Though Adcock (1977) found a relationship between size and actual

managerial behavior, Cummings and Berger (1976) concluded that no relationship existed.

These four organization variables, hierarchical level, line versus staff, span of control, and number supervised, were included in this study primarily since Adcock (1977) included them and since this study is a replication of his study. Beyond this reason, the four variables are firmly entrenched in management theory and thought. All have been examined empirically over the years, and one can reasonably conclude from the existing empirical data that these variables should affect managerial behavior.

#### PERSON VARIABLES

Early management thought evolved around efficiency and the best way to organize almost ignoring personal inputs to the organization. Wren (1979) referred to this period as the Scientific Management Era; however, as this period ended, the Social Man Era entered. Elton Mayo's research at Western Electric brought to light the fact that people and groups affect work (Wren, p. 299-312). Barnard acknowledged the role of individual characteristics in an organization by acknowledging that for an organization to be integrated as a system, the members of that organization must be willing to cooperate (Wren, p. 338-342). Davis too emphasized the need to recognize the role of people in organizations. Davis

recommended that nine factors be considered when developing an organization. Two of these included personal characteristics and abilities and the quality of the leadership (Davis, 1928, p. 41). The importance of personal characteristics is further supported by the works and writing of Argyris (1957), McGregor (1960), and Herzberg (1960). Likewise, the emphasis on theories of leadership over the years support the criticality of the individual in the organization (Blake and Mouton, 1964; Fiedler, 1974; House, 1971). So theory allows one to hypothesize that just as organization variables affect managerial behavior so do person variables.

Individuals attracted to an organization bring with them their skills, abilities, motives, values, and self-image. There obviously will be some degree of interaction between the organization and individuals attracted to it. Generally, military organizations will be attractive to certain people and not to others. One's particular personal make-up will affect the activities one chooses to engage in. Likewise, that individual make-up will affect with whom one interacts. Person variables have been examined by many who believe that person variables affect behavior. Campbell et al (1970) concluded that as much as 30 to 50 percent of variance in managerial performance results from individual differences. Stewart (1976) also concluded that the pattern one sees as a



manager performs his work results both as a result of the job and of choice (p. 37). Though some hold the position that managerial behavior is more a response to job/organizational situations, the position taken here is that one must believe that behavior is a function of both the environment and the individual. There are intrinsic differences between individuals and these differences interacting with environmental variables produce behavior (O'Reilly, 1977; Seiler, 1967). This research examined the effects of three specific person variables: marginality, n Ach, and leadership orientation.

These particular variables were chosen for various reasons. Abilities, motives, and values can be considered as primary personal inputs that individuals bring to an organization. As such, marginality is an ability, n Ach is a motive, and leadership orientation is a value. Likewise, all have a sound basis in management theory. Each variable has a sound theoretical basis for believing it would affect managerial behavior. Additionally, the existing literature allows one to relate specific managerial behaviors to these variables. Thus, one can hypothesize about the roles a manager possessing these person characteristics would elect to engage in.

The relevant general literature regarding these variables is discussed as well as any literature directly associating these variables with Mintzberg's roles.

However, this is the only study to examine the relationship between actual managerial behavior and person variables.

### Marginality

Ziller, Stark, and Pruden define marginality as

. . . a personality orientation by which environmental information is translated into personal meaning through individuals' perceived representation of themselves in relation to significant others. (1969, p. 489)

Ziller (1969, 1973) presented a contemporary view of marginality in his social psychological theory of personality. According to this view of marginality, it can be a positive force. Individuals perceive themselves as marginal; while in the more classical view, groups view individuals as marginal and thus marginality was viewed as dysfunctional. The difference is

In contrast to traditional discussions of marginality, the concept as presented here is phenomenological in orientation. The individual's orientation to the group is central rather than the group's orientation to the individual. When a group perceives an individual as marginal, alienation is suggested. When the individual perceives himself as marginal, however, a more positive view may evolve. (Ziller, 1973, p. 47)

Thus, a marginal individual is one who possesses the ability to not see himself solely as a member of one of two different groups. Instead, the marginal individual can objectively understand the values and opinions of both groups. The foreman is a classic case. The foreman is the man in the middle. He may not feel strongly that he is a member of either the labor group or management,

yet he can understand the values and opinions of both. Thus, ". . . the marginal person is someone who stands on the boundary between two or more groups that have differing value systems, goals, and behavior problems" (Browne et al, 1977, p. 494). Thus, specific behaviors can be expected from marginal individuals. Each of the following works presented provide insight into the marginal individual and allows one to hypothesize on the roles one would expect marginal individuals to engage in more frequently than non-marginal individuals.

Ziller also stated that "Marginality was also assumed to be associated with a state of information search prior to decision making" (1973, p. 50). Thus, the marginal individual sees himself as not belonging to significant other groups (Ziller, 1973, p. 47). This ability then allows the marginal individual to be 'open-minded' - a fact supported by a negative correlation between marginality and dogmatism (Ziller et al, 1969, p. 493; Cotton, 1977, p. 134; Ziller, 1973, p. 50). As a result of these characteristics, research has shown that marginal individuals have the skills of integrators who must seek to achieve a unity of effort among different groups (Lawrence and Lorsch, 1967) by being open-minded and having adaptable information processing capacities (Browne et al, 1977, p. 494). Liddell pointed out that marginal individuals are more adept at resolving intergroup conflict (1973,

p. 156). This leaves one with the view of the marginal individual as open-minded and non-dogmatic with adaptable information processing capacities (Ziller, 1973, p. 50).

In social psychological theory, marginality is viewed as a person variable that affects behavior. Marginal individuals possess certain traits and characteristics that predispose them to specific behaviors. These behaviors are associated with specific managerial roles as discussed in the next chapter.

#### Need for Achievement

Need theories of motivation have existed for years. Ivancevich et al classify these theories as either content, process, or reinforcement theories (1977, p. 103-124). The content theories attempt to determine what it is that brings about actual behavior. This approach considers a motive to be internal to the individual. Examples of this approach include Maslow's (1954) need theory, Herzberg's (1960) two-factor theory, and Alderfer's (1972) ERG theory. While content theories aid the understanding of what moves individuals to act, they do not answer why individuals choose particular activities. Process theories undertook this task. Vroom's (1964) expectancy theory and Adam's (1963) equity theory are typical process theories of motivation. Reinforcement theory is based on learning theory and Skinner's (1971) work. Under this approach, one argues that individuals are relatively passive and

strictly react to the forces impacting him. Also, permanent changes in behavior occur through reinforcement. The achievement approach to motivation is a content theory approach to motivation.

Ivancevich et al point out that need for achievement, or n Ach, is the most studied of all work related motives (1977, p. 59). When examining the theoretical fit of n Ach, it fits within the content approach since it explains what brings about action. Atkinson and Feather (1966) stated that n Ach is a desire to reach an objective which brings satisfaction to the individual, i.e., a feeling of pride. Thus, n Ach causes people to act in specific ways. The following studies were presented because they related n Ach to specific behaviors or roles.

N Ach has been examined over the years and considered a desirable trait for managers to possess (Campbell et al, 1970, p. 7). The basis of the need theory of motivation is that an individual with a high n Ach will act when he perceives certain behaviors as leading to achievement feelings. Hampton, Summer, and Webber (1978) characterized an individual with high n Ach as predisposing

. . . the individual to engage in setting goals, trying to improve performance to reach goals, and realistically seeking and using feedback on performance; n Achievement has no emphasis on people. (p. 17)

Consequently, high n Ach suits individuals for the entrepreneur role (Brockhaus, 1976, p. 13). Thus, the

entrepreneur acts to find better ways of doing things to get ahead and obtain personal satisfaction. McClellan (1961) stated:

Probable common term between n Achievement and entrepreneurship was a similar interest in situations involving moderate risk or maximum opportunity of getting personal achievement satisfaction without running undue risk of failure. (p. 59)

Mintzberg (1973) himself tied these thoughts together. He listed eight managerial job types. One was the entrepreneur. This man was characterized as spending a good part of his time seeking opportunities and implementing changes in his organization.

Need for achievement has a strong basis in motivation theory. Those with high n Ach can be expected to behave in a certain manner. Likewise, the literature relates high n Ach to entrepreneurial behavior.

#### Leadership Orientation

Leadership, as a concept, has been of interest to mankind for centuries. Even so there is still no single theory or definition of leadership that is accepted universally. Several categories of leadership theories exist. Ivancevich et al categorized these as trait, behavioral, and situational (1977, p. 274). Bass listed six trait categories that have been emphasized in the literature: physical characteristics, social background, intelligence and ability, personality, task-related characteristics, and social characteristics (1981, p. 77-81).

According to this theory, one should be able to find traits common to leaders. The results have basically been unsuccessful (Ivancevich et al, 1977, p. 276-277).

The behavioral theories of leadership concentrate on style, i.e., what a leader does and how he does it (Ivancevich et al, 1977, p. 277). These theories generally emphasize two styles of leadership. The Ohio State studies named the styles initiating structure and consideration.

1. Initiating structure, which concerned the degree to which the leader organized and defined the task, assigned the work to be done, established communications networks, and evaluated work group performance.

. . .

2. Consideration, which was defined as behavior that involves trust, mutual respect, friendship, support, and a concern for the welfare of the employees. (Ivancevich et al, 1977, p. 278)

The second major study examining a behavioral theory was the University of Michigan studies. In these studies the two styles were named job-centered and employee-centered.

1. Job-centered leadership style, which focused on the use of close supervision, legitimate and coercive power, meeting schedules, and evaluating work performance. . . .

2. Employee-centered leadership style, which is people oriented and emphasizes delegation of responsibility and a concern for employee welfare, needs, advancement, and personal growth. (Ivancevich et al, 1977, p. 280)

These two approaches differ from the trait theories in that they examine what leaders perceive they do while

the trait theories examine personal characteristics of leaders. As with the trait theories, the behavioral theories failed to find a universal leadership theory. Situational factors are important.

According to the situational theories, leadership is affected by managerial characteristics, group factors, subordinate characteristics, and organizational factors. The particular style that is appropriate at a point in time depends upon the four characteristics and factors listed previously. Fiedler's (1974) Contingency Theory was one of the first situational theories. According to Fiedler, one must evaluate three factors to determine the appropriate leadership style for a leadership position. The factors are task structure (high or low), leader-member relations (good or bad), and leader position power (strong or weak). Depending on these conditions, either a task oriented or employee oriented individual should be in the leadership position. The contention was that leaders do not change their style readily; therefore, one must assign the proper individual for the situation to the particular position. The particular works discussed below are important to this study in that they address styles of leadership and attempt to relate particular activities to these styles.

Leadership orientation was the only person variable discussed by Mintzberg (1973). Mintzberg presented six



basic purposes managers must serve (p. 95-96). Two of these related directly to the leader role:

2. The manager must design and maintain the stability of his organization's operations. The manager must program the operations of his organization and monitor these programs to insure a steady pattern of workflow. He must correct deviations when they occur and he must allocate new resources, as they become available, to ensure the smooth flow of operations. As leader, he must develop and sustain an atmosphere in which the necessary work will get done. . . .

3. The manager must take charge of his organization's strategy-making system, and therein adapt his organization in a controlled way to its changing environment. As monitor, the manager must be familiar with environmental trends and as entrepreneur and leader he must provide direction for his organization and introduce change in such a way that the organization adapts to it without unnecessary disruption. (p. 95)

Purpose three is comparable to the activities normally ascribed to task-oriented leaders while purpose two relates to the relationship-oriented view in the term 'atmosphere'.

Mintzberg himself argued that though a large amount of research has been done on the style of leadership, nothing has of yet been done with style and actual work performed. That which has been done tried to link style with effectiveness. Mintzberg stated that ". . . we may be able to learn much of interest by studying the effect that the personality and style of the incumbent have on the work performed" (1973, p. 119). Sayles (1964) and Bassett (1966) support this view.

Since this study is primarily concerned with behaviors, task-orientation versus relationship-orientation will be examined since it is possible to associate behaviors with each of these styles. The task-oriented leader typically acts to organize and define roles within the group, to explain what activities each member should do and when, where, and how tasks are to be accomplished, and to establish well defined patterns of organization, channels of communication, and ways to get the job done (Fiedler and Chemers, 1974; Rice, 1978; Yukl, 1981). Other activities which the task-oriented leader would engage in consist of making plans, formulating procedures, setting standards, assigning and organizing work, evaluating performance, and scheduling work.

The relationship-oriented leader on the other hand is concerned primarily with maintaining personal relationships between himself and subordinates by opening up channels of communication, providing socioemotional support, and facilitating behavior; showing concern, understanding, warmth, and sympathy for the feelings and opinions of his subordinates; being considerate of subordinates' needs; and being willing to explain his behavior (Fiedler and Chemers, 1974; Rice, 1978; Yukl, 1981).

Ford (1981) conducted research relevant to this study. He examined the effects of certain variables

on leader behavior. Leader behavior was operationalized using the LBDQ XII questionnaire where each respondent was categorized on initiating structure and consideration (p. 283). Three organizations were sampled: a book publishing company, a bank branch, and a midwestern university (p. 278). The sample consisted of 470 managers though the data was aggregated into scores for 25 departments in which these managers worked (p. 283). Specifically, Ford hypothesized that "Increases in size will be inversely related to leader structuring behavior and consideration" (p. 276).

Ford argued that as the size of a unit increased, the supervisor would have less time for consideration activities. Likewise, as the size increased, the manager would have less time for structuring behaviors. These two positions occur since the manager must spend more time handling exceptions, processing information, and coordinating activities within and between units (p. 276). His results were mixed. His hypothesis regarding size and consideration were supported though his hypothesis regarding structuring behavior was not (p. 284).

Regarding leadership, very little work has been done relating leadership style to particular leader actions. The above studies indicated the complexities of leadership and the effects of certain variables such as the size of a unit. Situational factors too affect leader activities.

## PRIVATE VERSUS PUBLIC

As Peabody and Rourke pointed out, the first problem when discussing private and public organizations is defining the two terms (1965, p. 802-804). Most individuals would agree that the Department of Defense, the state departments of highways, and the United Nations are public organizations. However, not all would agree that privately-owned utility companies and labor unions are public organizations. Rainey et al also emphasized that defining public and private organizations is difficult. They stated that there are four means of defining the terms: common sense approaches, practical definitions, denotative definitions, and analytic approaches. The common sense approach just discusses differences between public and private organizations without actually defining the terms. Practical definitions use rules of thumb to differentiate the organizations. Rainey et al provide the example of the Bureau of Labor Statistics classifying the Postal Service and Tennessee Valley Association as private organizations in calculating certain statistics. The denotative approaches simply list activities or organizations that are public and those that are private. Finally, the analytic approaches differentiate the sectors by defining factors or sets of factors for each (1976, p. 234). In this study a public organization is one that is government owned while a private organization

is privately owned. These differences have definitely led to a blurring of public and private organizations.

Rainey et al reviewed the existing literature to identify any consensus on differences between public and private organizations. These distinctions fell into three major factors: environmental, organization-environment transactions, and internal structures and processes (1976, p. 235-241). These are listed in Table 2. Theoretically, opinions differ on the degree of difference between private and public organizations.

Overstreet (1980) pointed out that some literature demands a more generic theoretical approach to management in the public and private sectors since they are more similar than different (1980, p. 1). McCurdy's study found that the majority of federal employees worked in jobs that were similar to those in the private sector (1978, p. 573). Opinions differ on the differences in management between the two sectors. Vorwerk (1979) conducted an interesting observational study addressing this issue.

Using an observational technique, Vorwerk (1979) undertook the study of public service workers as discussed earlier. One of Vorwerk's main research questions was "How do the duties or activities of a manager in a municipal organization differ from those of a manager in the private sector?" (p. 16). To answer this question, Vorwerk compared his findings to those of previous studies

Table 2

Summary of Literature on Differences between Public and  
Private Organizations: Main Points of Consensus

Topic	Proposition
<b>Environmental Factors</b>	
Degree of market exposure (Reliance on appropriations)	Less market exposure results in less incentive to cost reduction, operating efficiency, effective performance
	Lower market exposure results in lower allocational efficiency (reflection of consumer preferences, proportioning supply to demand, etc.)
	Less market exposure means lower availability of market indicators and information (prices, profits, etc.)
Legal, formal constraints (courts, legislature, hierarchy)	More constraints on procedures, spheres of operations (less autonomy of managers in making such choices)
	Greater tendency to prolifera- tion of formal specifications and controls
	More external sources of formal influence, and greater fragmentation of those sources
Political influences	Greater diversity and intensity of external informal influences on decisions (bargaining, public opinion, interest group reactions)
	Greater need for support of "constituencies" - client groups, sympathetic formal authorities, etc.

Table 2 (con't)

Topic	Proposition
Organization-Environment Transactions	
Coerciveness ("coercive," "monopolistic," unavoidable nature of many government activities)	More likely that participation in consumption and financing of services will be unavoidable or mandatory (Government has unique sanctions and coercive powers.)
Breadth of impact	Broader impact, greater symbolic significance of actions of public administrators (Wider scope of concern, such as "public interest")
Public scrutiny	Greater public scrutiny of public officials and their actions
Unique public expectations	Greater public expectations that public officials act with more fairness, responsiveness, accountability, and honesty
Internal Structures and Processes	
Complexity of objectives, evaluation and decision criteria	<p>Greater multiplicity and diversity of objectives and criteria</p> <p>Greater vagueness and intangibility of objectives and criteria</p> <p>Greater tendency of goals to be conflicting (more "tradeoffs")</p>
Authority relations and the role of the administrator	Less decision-making autonomy and flexibility on the part of public administrators

Table 2 (con't)

Topic	Proposition
Organizational performance	Weaker, more fragmented authority over subordinates and lower levels (1. Subordinates can bypass, appeal to alternative authorities. 2. Merit system constraints.)
	Greater reluctance to delegate, more levels of review, and greater use of formal regulations (Due to difficulties in supervision and delegation, resulting from greater vagueness and intangibility of objectives and criteria)
	More political, expository role for top managers
Incentives and incentive structures	Greater cautiousness, rigidity, less innovativeness
	More frequent turnover of top leaders due to elections and political appointments results in greater disruption of implementation of plans
	Greater difficulty in devising incentives for effective and efficient performance
Personal characteristics of employees	Lower valuation of pecuniary incentives by employees
	Variations in personality traits and needs, such as higher dominance and flexibility, higher need for achievement, on part of government managers



Table 2 (con't)

Topic	Proposition
	Lower work satisfaction and lower organizational commitment

Note. Adapted from Rainey et al, 1976, p. 236-237.

in the private sector (p. 99). He answered this question using subjective versus statistical comparisons.

In his study, the managers spent 65 percent of their time in verbal communications. In the private sector studies (Burns, 1954; Guest, 1956; Stewart, 1966; Lawler et al, 1968; Byrd, 1972; Helmreich, 1975; Dahl, 1975), the managers spent an average of 70 percent and median of 66 percent of their time in verbal communications (p. 102).

Next, Vorwerk examined the control that a manager had over his time. He did this by comparing the percentage of actions initiated by the managers. In his study 47 percent of the actions were initiated by the manager while the mean of the comparison group was 53 percent with a median of 50 percent (p. 103).

In examining the management functions, only Vorwerk's negotiating function directly related to this study. In the two private sector studies 6 and 8 percent of the time was spent in this function while only 3 percent of the time was spent negotiating in Vorwerk's study

(p. 104). Overall, Vorwerk found very little evidence of differences in managerial behaviors.

Lau et al (1980) examined the work of 370 top level U.S. Navy civilians using primarily a questionnaire based on Mintzberg's roles. Their two research questions were

1. Do managers in the public sector engage in activities that correspond to Mintzberg's managerial role descriptions? What are the major role functions in the public sector? Are these role functions the same in the public and private sectors?

2. What are the characteristics of the public sector managerial job? Are they similar to those in the private sector? (p. 514)

The bottom line of the study was that ". . . generalizations regarding differences between public and private sector managers and executives may frequently be overstated" (p. 519). Lau et al also administered the questionnaire to a group of private sector managers. Very little difference existed in how the managers rated the importance of the various roles (p. 519).

In a follow-on study, Lau et al investigated the first research question above and added another question relative to this study: "Q3. Are the characteristics of the public sector managerial job the same as those of the private sector?" (1980, p. 340). The same Navy sample discussed above was used and a sample of 220 managers from a variety of private organizations in southern California were sampled (p. 340). The differences were minimal

between samples. The relative rank ordering of the roles based on importance ratings yielded a Spearman rank order correlation of 0.789 with a  $p < 0.01$  (p. 342).

Overstreet (1980) used Miner's Role Motivation Theory to compare managers in the public and private sectors. Literature already existed examining the private sector using Miner's Theory, and Overstreet sampled state workers in Florida. He found that the public workers had less motivation to be assertive and competitive (p. 167).

The Scott study (1983) was discussed earlier. She studied the behaviors of a middle-level public education manager and a middle-level public service manager. This was not a comparison between public and private; however, she found that the public service manager included more negotiator and entrepreneur activities in his routine than did the public education manager (p. 47).

Though opinions differ on management in the public and private sectors, the only observational study (Vorwerk, 1979) found very little difference. Lau et al (1980) surveyed civilian managers in a military organization and managers in the private sector using Mintzberg's role concept and also found very little difference. Likewise, Scott (1983) found little difference. To date, the evidence is inconclusive.

## ADCOCK'S STUDY

As stated before, Mintzberg's ten roles and his Contingency View of Managerial Work gave rise to considerable research. One such effort was Adcock's work (1977). His dissertation consisted of three phases. In the first phase, Adcock used Mintzberg's verbal contact categories to develop a form which was then used to map managerial activities onto roles for the subsequent phases of his research. During the second phase, Adcock used a special version of activity sampling to gather data on the role behavior of certain practicing managers. Finally, in the third phase of his study, Adcock used the phase two data to determine if the specified roles existed and to determine if specified organization variables influenced how the managers distributed their time among the various roles (1977, p. 7). Thus, Adcock's research served as the foundation of this dissertation which expanded on Adcock's work and replicated it.

As an initial review of Adcock's work, it is necessary to examine his theoretical basis, his mapping technique, and his methodology. These were Adcock's major contributions.

Theoretical Basis

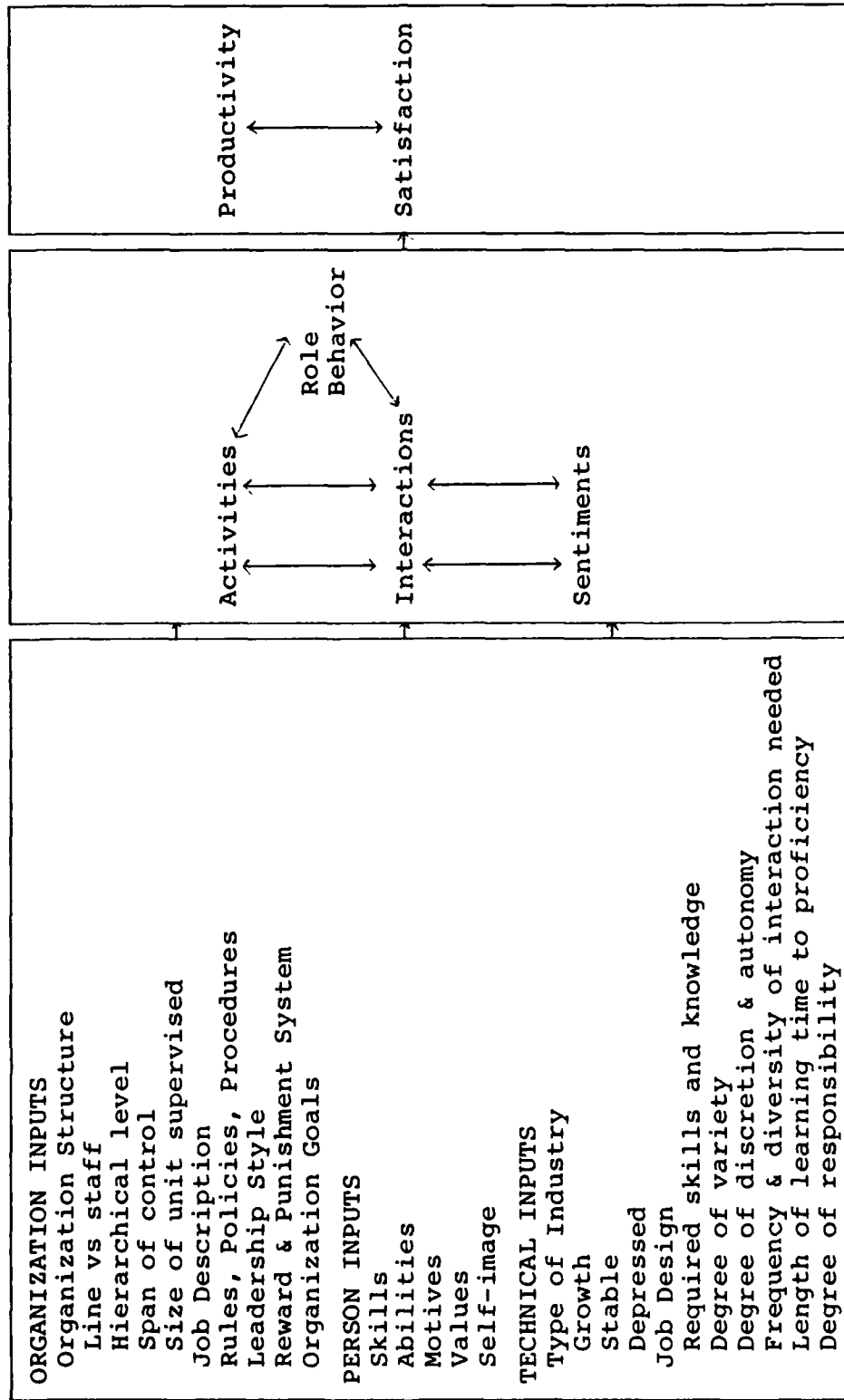
Using Seiler's input-output behavior model (1967, p. 23-32) and the contingency model of Campbell et al

(1970, p. 10-15), Adcock developed his Model of Organizational Behavior presented in Figure 2. The model was developed specifically to allow for Mintzberg's role theory. Each major set of input variables affects actual behavior. The technical input affects the type of people employed in a particular organization by establishing specific required skills, abilities, and educational levels. Within the firm itself, the design of jobs also affects the particular type of personnel working within an area. As these inputs attract certain people to a firm, these people in turn bring specific personal inputs with them.

These personal inputs were divided into five sets: skills, abilities, motives, values, and self-image. Each of these sets in turn affect actual behavior through their effect on activities, interactions, and sentiments. Skills, abilities, and motives will directly affect both the activities and interactions one engages in. Likewise, motives, values, and self-image have an affect on one's activities, interactions, and sentiments.

The last category of inputs is organization inputs. These sets of variables directly determine the required behaviors. The particular organization structure variables impinging on an individual determine his behaviors. The organizational structure variables consist of line versus staff, hierarchical level, span of control, and

Figure 2. Model of organizational behavior.



Note. From Adcock, 1977, p. 11.

the size of the unit supervised. Likewise, the required behaviors are determined by the job description; organizational rules, policies, and procedures; leadership style; reward and punishment system; and organizational goals. These inputs then result in actual behavior in the organization.

Actual behavior consists of both required and emergent behaviors. Required behaviors are those that are required on the job while emergent behavior is that which emerges through the activities, interactions, and sentiments that exist. This emergent behavior may facilitate the actual required behaviors or may not even directly relate to those. Regardless, actual behaviors consist of observable activities and interactions and develop in part due to sentiments existing in the group. Activities are the things that people do, i.e., talk, run, write, etc. Interactions consist of contacts between two or more individuals and may be verbal or nonverbal. Sentiments are ideas, beliefs, or feelings existing within or between individuals (Lawrence et al, 1965, p. 156). Finally, from observing particular actual behaviors, one can infer the role behavior of an individual (Adcock, 1977, p. 18-19). As a result of the inputs and actual behaviors, certain outputs are experienced.

For the organization, the output consists of productivity. For the individual, a level of satisfaction is

experienced. The relationship between these two outputs is complex and, as of yet, not explained. In any case, the results of these outputs then feed back and affect both the inputs and the actual behaviors. This model is based upon other Socio-technical models and theory; however, it can be reconciled with Mintzberg's role theory.

In explaining his ten roles, Mintzberg first starts with a manager's position. This position provides both formal authority and status to an individual manager. This status and authority give a manager the responsibility for performing the interpersonal roles. First among these is the figurehead role. The manager is required to represent his 'organization' on all formal matters. Organization here means the unit over which the manager has charge. Thus, organization and unit could be used interchangeably. In his position, the manager is required to interact with his peers. This then is his liaison role. Finally, in the leader role, the manager engages in activities and interactions with subordinates for the purpose of motivating, staffing, promoting, etc. (1973, p. 56). Adcock (1977) added another interpersonal role. This was the subordinate role. Adcock classified behaviors in which managers interacted with their boss as forming the subordinate role. Also, certain interactions in which a manager requests another for an appointment or to initiate something were classified as part of the



subordinate role (p. 113-117). These interpersonal roles then give rise to the informational roles.

In accomplishing his duties, the manager finds a need to both give and receive information. As a monitor, the manager receives and collects information to better understand his organization and perform his duties. As a disseminator, the manager provides information to members of his unit. Lastly, when the manager is disseminating information from his unit, he is acting as a spokesman. The last group of roles discussed are the decision-making roles (Mintzberg, 1973, p. 56-57).

The manager's access to information coupled with his status and authority make him a key decision point. As an entrepreneur, the manager initiates change in his unit. As a disturbance handler, he is reacting to change. When resource allocation decisions are required, the manager is a resource allocator. At times, the manager acts as a negotiator when he negotiates on behalf of his unit (p. 57). Thus, by examining specific activities and interactions, one can map actual behavior onto specified roles. A key question is "What determines how managers distribute their time among the roles?"

By examining the inputs of Figure 2, a theoretical answer can be seen. Adcock concentrated on the four organization inputs: line versus staff, hierarchical

level, span of control, and size of unit supervised.

This reflects Mintzberg's belief that

The greater part of the evidence on differences in managerial jobs relates to features of the job itself - namely, the level in the hierarchy and the function supervised. Researchers have found that these two factors - particularly function - account for more variation than any other factors. (1973, p. 109)

Lower-level managers can be expected to allocate their role activities differently than higher-level managers. Additionally, line managers' jobs can be expected to differ from staff managers. Adcock thus developed a micro-model of organizational behavior which he used for the last two phases of his dissertation. This micro-model is presented in Figure 3.

Since Adcock studied only one organization, he argued that the following variables were held constant: rules, policies, and procedures; reward and punishment system; organizational goals; and type of industry. Adcock did however state:

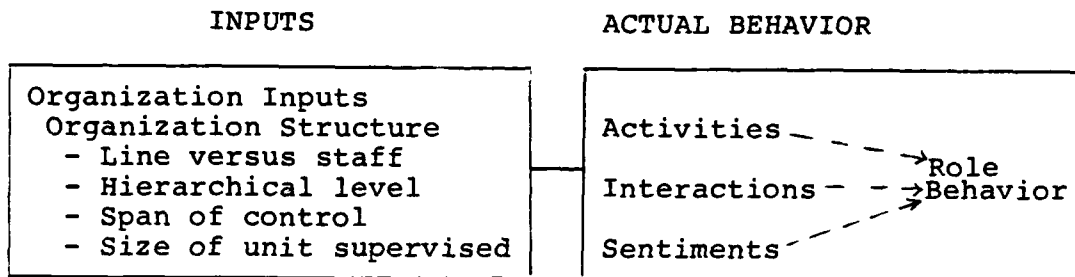
Although the Person variable was surely operative in this research, to account for the influence of these factors was beyond the scope of this undertaking. (1977, p. 38)

This then was the theoretical basis of Adcock's work.

#### The Mapping Technique

Adcock's method of mapping managerial behavior onto the eleven roles was the key aspect of his research. These behaviors as discussed previously consisted of

Figure 3. Micro-model of organizational behavior.



Note. From Adcock, 1977, p. 18.

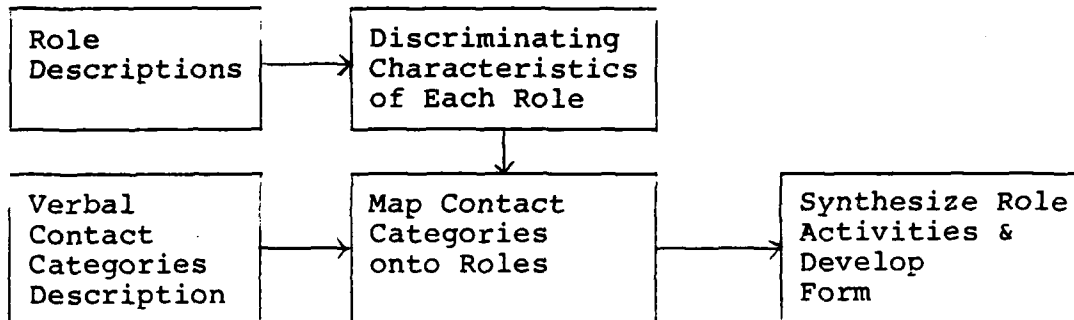
observable activities and interactions. This fact combined with Mintzberg's verbal contact categories allowed Adcock to develop a form for mapping behaviors onto the roles.

Figure 4 shows the process Adcock used to develop the form.

The process was very complex at times. Mintzberg himself pointed this out:

Hence, the researcher interested in studying precisely how much time a given manager spends in each of these ten roles - an obvious next step for comparative research - must first develop some clearer mapping of activities onto roles. This should not be a difficult task. It may involve the making of a few arbitrary decisions, but the overall result should be generally valid and useful. One should have little difficulty observing a manager and then estimating the time he spends in the figure-head, disseminator, liaison, spokesman, and negotiator roles (although there may be some overlap in these last three). The entrepreneur and disturbance handler roles overlap at the margin . . . , and it may be difficult to distinguish some activities in terms of these roles and the resource allocator role. . . . It will be somewhat more difficult to determine how much time the manager spends in the leader role (and, to a lesser extent the monitor role). The proportion of his work with subordinates that is expressly for interpersonal purposes will probably give a good relative indication of his involvement with the leader role (just as the amount of time spent expressly receiving information

Figure 4. Derivation of form.



Note. From Adcock, 1977, p. 21.

will probably provide a reasonably accurate estimate of his attention to the monitor role). (1973, p. 268)

Adcock undertook this task and developed his form presented as Figure 5. The details of this development are presented later.

Mintzberg's thirteen verbal contact categories were used. These consisted of nonmanagerial work, scheduling, ceremony, external board work, status requests and solicitations, action requests, manager requests, observational tours, receiving information, giving information, review, strategy, and negotiation (1973, p. 249-257). By examining the distinguishing characteristics of each role and examining the verbal contact categories, certain simple mappings were determined. These are presented in Table 3. The remaining verbal contact categories involved more complex mapping.

Giving information was mapped onto the disseminator or spokesman role depending on whether the information

Figure 5. Adcock's form.

Time of Day \_\_\_\_\_  
Date \_\_\_\_\_

## MANAGEMENT ACTIVITIES FORM

WHO/WHAT	INFORMATION	REQUESTS	REVIEW	NEGOTIATION	CEREMONY
<u>With Whom</u> <input type="radio"/> Subordinate(s) <input type="radio"/> Peer Manager(s) <input type="radio"/> Employee(s)-other <input type="radio"/> Boss(es)-immediate/higher <input type="radio"/> Outsider(s) <input type="radio"/> Combination above <input type="radio"/> Alone <u>Doing What</u> <input type="radio"/> Meeting <input type="radio"/> Telephoning <input type="radio"/> Touring <input type="radio"/> Desk work <input type="radio"/> Other	<u>Giving/Receiving Info</u> <input type="radio"/> Giving <input type="radio"/> Receiving <u>To Whom/From Whom</u> <input type="radio"/> Subordinate(s) <input type="radio"/> Peer Manager(s) <input type="radio"/> Employee(s)-other <input type="radio"/> Boss(es)-immediate/higher <input type="radio"/> Outsider(s) <input type="radio"/> Combination above <input type="radio"/> Nature of Info <input type="radio"/> Instant communication/rumors <input type="radio"/> Briefings <input type="radio"/> Advice/opinions <input type="radio"/> Plans/policies <input type="radio"/> Industry/company news <input type="radio"/> Work progress/status <input type="radio"/> Other	<u>Making/Handling Requests</u> <input type="radio"/> Making <input type="radio"/> Handling <u>To Whom/From Whom</u> <input type="radio"/> Subordinate(s) <input type="radio"/> Peer Manager(s) <input type="radio"/> Employee(s)-other <input type="radio"/> Boss(es)-immediate/higher <input type="radio"/> Outsider(s) <input type="radio"/> Combination above <input type="radio"/> Request for What <input type="radio"/> Authorization <input type="radio"/> Information <input type="radio"/> Initiate something <input type="radio"/> Influence <input type="radio"/> Investigation <input type="radio"/> Follow-up <input type="radio"/> Appointment <input type="radio"/> Action <input type="radio"/> Favor <input type="radio"/> Joining outside boards/serving committees <input type="radio"/> Speaking/attend social/civic function <input type="radio"/> Other	<u>Type of Review</u> <input type="radio"/> Deputy <input type="radio"/> Functional <input type="radio"/> Contact <input type="radio"/> New-man <input type="radio"/> Post-meeting <input type="radio"/> Other <u>STRATEGY</u> <u>Type of Meeting</u> <input type="radio"/> Key organizational decisions <input type="radio"/> New organizational program <input type="radio"/> Crisis handling <input type="radio"/> Operational planning <input type="radio"/> Budgeting <input type="radio"/> Resource allocation <input type="radio"/> Target setting <input type="radio"/> Improvement project <input type="radio"/> Other	<u>Negotiation with Whom</u> <input type="radio"/> Peer Manager(s) <input type="radio"/> Employee(s)-other <input type="radio"/> Outsider(s) <input type="radio"/> Combination above <u>About What</u> <input type="radio"/> Costs/manpower/budgets <input type="radio"/> Specifications <input type="radio"/> Time/schedule <input type="radio"/> Other <u>PERSONNEL ADMINISTRATION</u> <input type="radio"/> Employee <input type="radio"/> Training/certification <input type="radio"/> Termination/layoff <input type="radio"/> Hiring/interviewing <input type="radio"/> Performance review/commendation <input type="radio"/> Discipline/reprimand <input type="radio"/> Salary/wage adjustment <input type="radio"/> Adjust/approve time charges <input type="radio"/> Award recommendation <input type="radio"/> Handling/resolving conflict <input type="radio"/> Other	<u>For Whom</u> <input type="radio"/> Subordinate(s) <input type="radio"/> Peer Manager(s) <input type="radio"/> Employee(s)-other <input type="radio"/> Boss(es)-immediate/higher <input type="radio"/> Outsider(s) <input type="radio"/> Combination above <u>Nature of Ceremony</u> <input type="radio"/> Retirement <input type="radio"/> Award <input type="radio"/> Anniversary <input type="radio"/> Promotion/transfer <input type="radio"/> Speech/address <input type="radio"/> Sign legal document <input type="radio"/> Other

Note. From Adcock, 1977, p. 302

Table 3

## Simple Mapping of Verbal Contact Categories to Managerial Roles

Verbal Contact Category	Managerial Role
Ceremony	Figurehead
Status Requests	Figurehead
Negotiations	Negotiator
Receiving Information	Monitor
Scheduling	Resource Allocator
External Board work	Liaison

Note. From Adcock, 1977, p. 95.

was going into or out of the unit, i.e., who received the information. Strategy was mapped onto the disturbance handler, entrepreneur, or resource allocator role. Mintzberg used the term strategy to include meetings about key organizational decisions, some organizational planning, budgeting, allocation of resources, and target setting (1973, p. 256-257). Thus, strategy dealing with budgeting, allocation of resources, and operational planning mapped to the resource allocator role. Handling crises mapped to the disturbance handler role while meetings dealing with potential organizational programs mapped to the entrepreneur role.

Manager requests for information or advice from subordinates mapped to the monitor role while those requests for action mapped to the leader role. Action requests too were complex. When subordinates requested authorization, the manager acted as a resource allocator.

When the subordinate asked for information, the manager was a disseminator. He was a spokesman, however, when someone other than a subordinate asked for information. If a manager asks a subordinate to initiate something, the manager may be acting as an entrepreneur. When a subordinate asks a manager to use his influence, he acts as a leader while the same request from someone else puts the manager in the figurehead role.

Reviews must occur in meetings. Deputy reviews map to the leader role while functional reviews map to the entrepreneur role. Contact reviews occur in social settings to trade rumors and are thus mapped to the monitor or spokesman role. New-man reviews map to the leader or disseminator role. Post-meeting reviews map to the monitor and disseminator roles (Adcock, 1977, p. 95-102). The final step was the synthesis of role activities into a form.

In developing the form, Adcock strove to attain four specifications. First, the respondent had to be able to select several of a list of possible activities from the form. The selected activities then had to indicate the role being performed. Second, the candidate activities had to be activities of Mintzberg's verbal contact categories where possible. Third, to facilitate selection, the activities had to be categorized; and the categories had to be Mintzberg's verbal contact

categories where possible. Fourth, the required number of selected activities had to be kept to a minimum for role detection (1977, p. 103). As Figure 5 shows, Adcock was successful in adhering to his specifications.

Mintzberg's review, strategy, negotiation, and ceremony categories are used with the form; however, the information, requests, and personnel administration categories do not strictly adhere to Mintzberg's categories. Table 4 illustrates the relationship between Mintzberg's categories and Adcock's categories. A discussion of each category follows.

Under the review category, Mintzberg listed functional, deputy, contact, new-man, and post-meeting reviews which are the same used by Adcock. Likewise, Adcock used Mintzberg's activities in the strategy category: key organizational decisions, new organizational programs, operational planning, budgeting, resource allocation, target setting, and improvement projects. In the negotiation category, it was assumed that a manager does not negotiate with his boss or subordinates thus leaving peers, other employees (non-subordinates), outsiders, or a combination. Negotiation subjects were costs/manpower/budgets, specifications, and time/schedules. The ceremony category too was rather straight forward requiring only that the manager realize he was involved in a ceremony. The respondent simply indicated for whom - subordinate, peer, employee, boss,



Table 4

Comparison of Mintzberg's Purpose Activity Categories to Adcock's Categories

Mintzberg's Categories	Form Categories
1. Review	1. Review
2. Strategy	2. Strategy
3. Negotiation	3. Negotiation
4. Ceremony	4. Ceremony
5. Giving information, receiving information, tours	5. Information
6. Status requests, action requests, manager requests, external board work, scheduling	6. Requests

Note. From Adcock, 1977, p. 105.

outsider, or combination - the ceremony was being conducted and the nature of the ceremony - retirement, award, anniversary, promotion/transfer, speech/address, sign legal document, other (Adcock, 1977, p. 107-108).

Regarding the leader role, Mintzberg included activities such as hiring, staffing, training, judging, remunerating, promoting, and dismissing employees (1973, p. 60-62). Thus, the personnel administration category encompassed all activities to be mapped to the leader role.

The information category was used to detect the monitor, disseminator, and spokesman roles. The subcategories aided in this identification. First, the respondent indicated whether he was giving or receiving information.

Next, he indicated to whom or from whom the information was going or coming. Last, the respondent indicated the nature of the information (Adcock, 1977, p. 109).

The requests category used all of Mintzberg's request categories: status, action, manager, external board work, and rescheduling. The respondent first indicated whether he was making or handling a request. Next, one indicated to whom or from whom he was making or handling the request. Lastly, the nature of the request was indicated (Adcock, 1977, p. 110).

The who/what category was vital to the instrument. In many cases, one must know who the manager was interacting with to determine the role occurring. Also, the what subcategory served as a validity check of Adcock's research by comparing his results with previous research into the time managers spend on meetings, on the telephone, touring, at desk work, etc. Also, the who/what answers served, in Adcock's programming, as a check on the answers provided. Obviously, a response indicating alone and in a meeting would be invalid (1977, p. 111). These completed responses were then used to determine the role a respondent was engaged in at the time he completed the form.

This section explained the mapping technique briefly. Since this same technique served as the mapping technique of this study, the technique is explained in much more

detail in the next chapter. The last significant part of Adcock's research was his methodology.

### Methodology

Various methods of research have both their advantages and disadvantages. Mintzberg listed seven methods of data collection for studying managerial work: secondary sources, questionnaire and interview, critical incident and sequence of episodes, diary, activity sampling, unstructured observation, and structured observation. Their advantages, disadvantages, and appropriate uses are listed in Table 5. By using a precoded form and randomly signaling respondents to complete the form, Adcock combined the advantages of using diary and activity sampling while overcoming the disadvantages of the observational techniques.

The diary and activity sampling are both efficient. They provide the opportunity of sampling a larger number of respondents than the observational technique allows. Generally, in the diary method, respondents are given precoded pads upon which they code their activities. Carlson (1951) used this method. Some problems in reliability exist. Are the respondents interpreting the words the same and thus recording similarly? Are the respondents continuously recording activities or are certain activities left unrecorded for some reason? Also, some managers object to taking time to record all

Table 5  
Seven Methods to Study Managerial Work

Method	Major Advantages	Major Disadvantages	Appropriate Use
Secondary sources	Convenient, draws on analyses of others	Data frequently unavailable, inappropriate, or incomplete	To study job of inaccessible manager
Questionnaire and interview	Convenient	Data of questionable reliability	To study manager's perception of his job
Critical incident and sequence of episodes	Allows for intense probing	Parts of job not covered by the data	To study certain aspects of job in depth (e.g., decision-making)
Diary	Efficient (large sample possible relative to researcher's time investment)	No help in developing understanding of new dimensions; some problems with interpretation, consistency, and reliability	To study characteristics of large sample of differing managerial jobs
Activity sampling	Efficient; recording by researcher	Little help in developing understanding of new dimensions; noncontinuous, hence interpretation difficult	To study observational aspects of different jobs in one location

Table 5 (con't)

Method	Major Advantages	Major Disadvantages	Appropriate Use
Unstructured observation	Enables researcher to understand new dimensions and to probe	Nonsystematic (may lose important data; cannot replicate); inefficient	To study the most complex, least understood aspects of manager's job content
Structured observation	Enables researcher to understand new dimensions, to probe, to be systematic	Inefficient (consumes much research time); difficult to interpret some activities	To study at same time content and characteristics of small sample of managers' jobs

Note. From Mintzberg, 1973, p. 229.

of their activities. Even with these difficulties, Mintzberg stated:

. . . we must conclude that the diary method is most useful where we wish to study the time distributed among known job factors. The method uses the manager to record data, and hence is most efficient for collecting data on large numbers of managers. (1973, p. 224)

Activity sampling typically involves a researcher randomly observing a respondent and recording his activity at that time. A criticism of this method is that it too records only observable behaviors and misses the unobservable. Likewise, one must question the reliability of such a technique. An observer cannot enter the respondent's mind and thus may erroneously categorize what he is doing.

Thus, Adcock (1977) used a signaling device to randomly signal respondents to complete the form Adcock developed. This overcame the problem of diary methods where respondents must record every activity. Thus, the disruption is lessened. Also, by having the respondent record his own activities, the problem of observer interpretation is overcome. In Adcock's research, the signaling device was a telephone pocket pager which each respondent carried with him throughout the period of the experiment. This device overcomes the disadvantages of desk top devices used in other experiments (Lewis and Dahl, 1976; Vorwerk, 1979).

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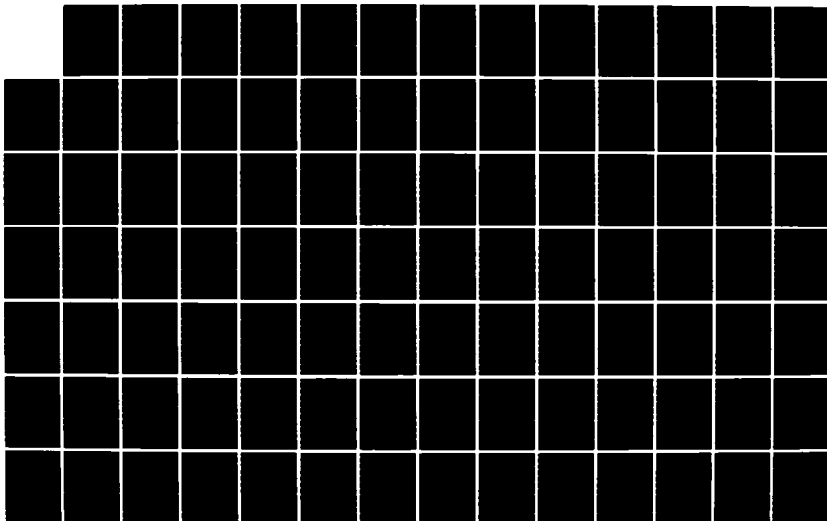
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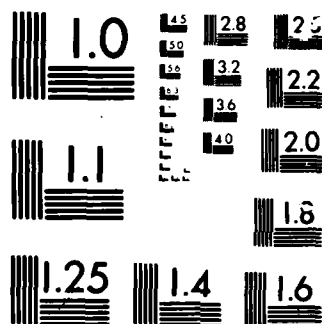
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## SUMMARY

This literature review has revealed the scarcity of observational/activity sampling studies based on Mintzberg's role concept. His work in 1973 did lead to some further studies (Ley, 1978; Scott, 1983); however, most other studies were done using surveys or were done on educational administrators rather than on managers.

There is some evidence in the literature to expect organization variables to affect the time distribution of managers in Mintzberg's roles as evidenced by Cummings and Berger (1976), Adcock (1979), Vorwerk (1979), Alexander (1979), McCall and Segrist (1980), and Pavett and Lau (1983). In addition Kast and Rosenzweig (1970), Seiler (1967), Campbell et al (1970), Mintzberg (1973), and Adcock (1979) have all found that person variables affect managerial activity. However, there is relatively little consensus in the literature on the particular effects of these variables and on whether management within the public sector is the same or different than management in the private sector.

Adcock's study has made a major contribution in the former area. He developed a method of efficiently mapping managerial activities to Mintzberg's roles and sampling actual managerial activity. This enabled him to study the effects of certain organization variables upon managerial role behavior in a private organization.

Additional studies of actual managerial activity are needed to verify his results and to extend the understanding of this area to include the effects of both organization and person variables in both public and private organizations.

## CHAPTER 3

### METHODOLOGY

This chapter is divided into four major sections. The first section deals with the mapping technique used in this study. It explains what entries on the Management Activities Form were mapped to which roles. Next, the statistical hypotheses which were developed to support the Research Hypotheses are presented. The statistical hypotheses fell into five categories. The first category included those which dealt explicitly with the roles. The next three examined theories dealing with the effect of organization, person, and combined variables on time in the various roles. Finally, the last hypothesis examined whether or not public and private managers allocate their time differently among the roles. The third major section of this chapter presents information on the sampling used. The organization sampled is described as is the sample itself. The actual data collection procedures and the results of those procedures are discussed. Finally, validity and reliability issues are addressed.

#### MAPPING ACTIVITIES ONTO ROLES

A major contribution of Adcock's work was the development of the mapping procedures used to map activities

to roles. The pertinent aspects of the development of the mapping methodology were presented in Chapter 2. A review of the procedures used to map the activities collected via the Management Activities Form is present here. As Mintzberg noted, some arbitrariness existed in mapping activities to roles (1973, p. 268). An example of such arbitrariness is mapping a new-man review. The mapping splits the sample one-half to the leader role and one-half to the disseminator role. The argument was that half the time was spent giving encouragement and advice to a new man, a leader activity, while the other half of the time was spent disseminating information about the organization to the new man. More detail on the rationale behind the mapping procedures can be found in Adcock (1977, p. 87-102, 111-128).

The Management Activities Form (Figure 5) was used to sample managerial activities. Each form was then mapped to a role depending on the activities checked. The mapping for each of the major categories is explained below.

#### Information

This category is rather straight forward. If a respondent gives information to a subordinate, the respondent is acting as a disseminator; otherwise, he is acting as a spokesman. Any receipt of information places the respondent in the monitor role (Adcock,

1977, p. 112). The requests category of the form is not quite so direct.

### Requests

The mapping rules used for this category are presented in Table 6. These specific mappings are based upon the information presented in Chapter 2. Not only does one need to know whether the respondent is making or handling a request, one must know the nature of the request being handled. The 'request for what' category was summarized from Mintzberg (1973). Combining these two with from whom or to whom the request is coming or going allows role mapping.

### Review

Mintzberg classified reviews as meetings and so did this study. Mapping of review activities involved some necessarily arbitrary decisions. When a respondent conducts a new-man or other review, one-half is mapped to the leader and one-half to the disseminator role. A post meeting review with a subordinate mapped one-half to the monitor and one-half to the disseminator role. From this follows the mapping of functional and post-meeting reviews with an outsider as one-half to the monitor and one-half to the spokesman role. Any functional review with a subordinate, peer, boss, and outsider is mapped one-half to the leader and one-half to the entrepreneur role.

Table 6

## Mapping Requests onto Roles

Requestor	Requestee	Request for	Respondent's Role
1. Respondent	Subordinate Boss	Authorization	Subordinate
2. Respondent	Anyone	Information	Monitor
3. Respondent	Anyone	Appointment	Subordinate
4. Respondent	Subordinate	Initiate something Influence Investigation Follow-up Action Favor	Leader
5. Respondent	Subordinate Peer Outsider	Joining outside boards/serving committees Speaking/attend social/civic function	Liaison
6. Respondent	Peer Employee-other Outsider	Authorization Initiate something Influence Investigation Follow-up Action	Negotiator

Table 6 (con't)

Requestor	Requestee	Request for	Respondent's Role
7. Respondent	Peer Employee-other Boss Outsider	Favor	Liaison
8. Respondent	Employee-other	Other	Negotiator
9. Respondent	Boss	Initiate something Influence Investigation Follow-up Action Joining outside boards/serving committees Speaking/attend social/civic function	Subordinate
10. Respondent	Combination	Follow-up	Negotiator
11. Anyone	Respondent	Authorization	Resource Allocator
12. Subordinate	Respondent	Information	Disseminator
13. Subordinate Boss	Respondent	Initiate something	Subordinate
14. Subordinate Boss	Respondent	Influence	Leader

Table 6 (con't)

Requestor	Requestee	Request for	Respondent's Role
15. Subordinate Peer Employee-other Outsider Combination	Respondent	Investigation Follow-up	Monitor
16. Subordinate Peer Outsider	Respondent	Appointment	Resource Allocator
17. Subordinate	Respondent	Action Favor	Leader
18. Anyone	Respondent	Joining outside boards/serving committees Speaking/attend social/civic functions	Liaison
19. Peer Employee-other Boss Outsider Combination	Respondent	Information	Spokesman
20. Peer Employee-other Outsider	Respondent	Initiate something	Leader



Table 6 (con't)

Requestor	Requestee	Request for	Respondent's Role
21. Peer Outsider	Respondent	Influence	Figurehead
22. Peer Employee-other Outsider Combination	Respondent	Action	Negotiator
23. Peer Employee-other Outsider Combination	Respondent	Favor Other	Liaison
24. Boss	Respondent	Influence Investigation Follow-up Appointment Action Favor	Subordinate

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Note. From Adcock, 1977, p. 114.

Contact, post-meeting, and other reviews with peers, bosses, and outsiders mapped one-half to the monitor and one-half to the entrepreneur roles. These mappings are controversial (Adcock, 1977, p. 117-120). See Table 7.

### Strategy

Mintzberg assumed that all strategy occurs in meetings. The particular mapping depended on the type of meeting being held. Table 8 summarizes these procedures. Meetings about key organizational decisions, new organizational programs, and improvement projects map to the entrepreneur role. These meetings deal with long-range, far-reaching decisions. Alternatively, meetings dealing with crisis situations map to the disturbance handler role. Finally, meetings revolving around operational planning, budgeting, resource allocation or target setting map to the resource allocator role.

The last three categories map rather directly to specific roles. All entries in the negotiator category mapped to the negotiator role. Likewise, all entries but one in the personnel administration category mapped to the leader role. The exception was handling/resolving conflicts which mapped to the disturbance handler role. Finally, all entries in the ceremony category mapped to the figurehead role (Adcock, 1977, p. 122-124). The above summarized the specific mapping procedures.

Table 7

## Mapping Review Categories onto Roles

With Whom	Doing What	Type Review	Respondent's Role
1. Subordinate	Meeting	Deputy	Leader
2. Subordinate Peer	Meeting	Functional	Entrepreneur
3. Subordinate	Meeting	New-man Other	½ Leader and ½ Disseminator
4. Subordinate	Meeting	Post-meeting	½ Monitor and ½ Disseminator
5. Peer Employee-other Outsider Combination	Meeting	Contact Post-meeting	½ Monitor and ½ Spokesman
6. Employee-other Outsider Combination	Meeting	Other	½ Monitor and ½ Spokesman
7. Boss	Meeting	Any	Subordinate
8. Outsider	Meeting	Functional	½ Monitor and ½ Spokesman
9. Combination	Meeting	Deputy	½ Leader and ½ Subordinate

Table 7 (con't)

With Whom	Doing What	Type Review	Respondent's Role
10. Combination	Meeting	Functional	$\frac{1}{2}$ Leader and $\frac{1}{2}$ Entrepreneur

Note. From Adcock, 1977, p. 119.

Table 8

## Mapping Strategy onto Roles

With Whom	Doing What	Type Meeting	Respondent's Role
1. Anyone	Meeting	Key organizational decisions New organizational program Improvement project Other	Entrepreneur
2. Anyone	Meeting	Crisis handling	Disturbance Handler
3. Anyone	Meeting	Operational planning Budgeting Resource allocation Target setting	Resource Allocator

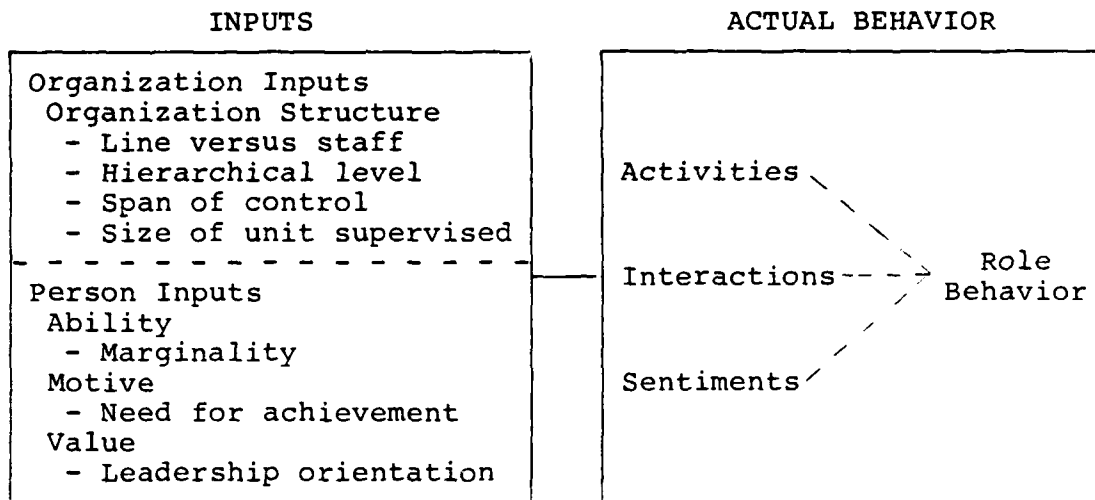
Note. From Adcock, 1977, p. 121.

## STATISTICAL HYPOTHESES

The statistical hypotheses relating to the organization and person variables tested in this study were theoretically based on the Expanded Micro-model of Organization Behavior (Figure 6). In Chapter 2, a Model of Organizational Behavior (Figure 2) was presented. It was argued that each major set of input variables affects actual managerial behavior due to the impact of the inputs on activities, interactions, and sentiments of a manager. The scope of this study did not allow for the examination of all possible input variables. This study was limited to examining two sets of input variables: organization inputs and person inputs.

The organization variables examined included line versus staff, hierarchical level, span of control, and size of unit supervised. Each of these variables have been studied for years (Cummings and Berger, 1976) and have a sound theoretical foundation in management theory. Kast and Rosenzweig postulated that organization variables impact the role expectations of managers (1970, p. 263). Seiler (1967) and Campbell et al (1970) each developed models of organizations that theorized that organization variables impact behavior in organizations. The fact that these organization variables have been studied extensively and were included in Adcock's (1977) study led

Figure 6. Expanded micro-model of organizational behavior.



to their inclusion in this study. In addition, this study included certain person variables as well.

Figure 6 illustrates the organization and personal variables examined in this study, while Adcock (1977) examined only the organization inputs - those above the dashed line in the input box of the model. Just as the organization inputs affect role behavior, it was hypothesized that person inputs too would affect behavior. Individuals attracted to an organization bring with them their abilities, motives, and values. There obviously will be some degree of interaction between the organization and individuals attracted to it. Generally, military organizations will be attractive to certain people and not to others. One's particular personal make-up will affect the activities one chooses to engage in. Likewise, that individual's make-up will affect with whom one interacts. Person

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MANAGERIAL ACTIVITY ANALYSIS VIA MINTZBERG'S ROLE THEORY:  
THE EFFECTS OF PERSON AND ORGANIZATION VARIABLES

(Publication No.                      )

Arthur Leo Rastetter, III, Ph.D.  
The Florida State University, 1985

Major Professor: William A. Shrode, D.B.A.

This research examined the contingency view of management using Mintzberg's role concept. A modified activity sampling methodology was used. Self-reported activities and interactions were mapped to one of eleven roles - Mintzberg's ten or a subordinate role.

The major research objectives were to test Adcock's modified activity sampling methodology to detect the role behavior of military managers, to verify that military managers act in all eleven roles, to determine the effect of selected organization and person variables and combined effects in how managers distribute their time in roles, and to detect differences between private and military managers regarding role behavior.

The methodology successfully detected role behavior. All eleven roles existed and the managers did not distribute their time in the roles uniformly.

Four organization variables had an effect on time in roles. Span of control affected the figurehead,



leader, task leader, monitor, entrepreneur, and resource allocator roles. Hierarchical level affected the figurehead, leader, spokesman, and resource allocator roles and may have had a wider effect if it were not highly correlated with the number supervised. Number supervised affected the figurehead, monitor, and disturbance handler roles. Line/staff functional area affected the disseminator, entrepreneur, and resource allocator roles but was correlated with span of control.

The time distribution among roles was the same for both military and private sector managers.

The results for the person variables were disappointing. Need for achievement (n Ach) affected the leader, task leader, and disseminator roles. Leadership orientation affected time in the figurehead role but was highly correlated with span of control. Marginality did not affect any role; however, it was correlated with leadership orientation. The combined effect, n Ach/mid-level management, affected the entrepreneur and negotiator roles. Overall, the organization variables affected the roles to a much greater extent than the person variables.

This study verified that management is contingent upon the situation. Researchers must move forward and determine what situations require what roles and skills and which of these in particular situations lead to effective results. Practitioners can then better select

managers for particular jobs. Together, systems of selection, appraisal, development, and promotion can be derived.

variables have been examined by many who believe these variables affect behavior. Mayo's research at Western Electric was among the first to indicate this relationship (Wren, 1979, p. 299-312). Barnard and Davis too recognized that personal variables impact behavior (Wren, 1979). From the work of these individuals and others, various theories arose.

Seiler developed an input-output model of human behavior. One of his four inputs was human while the other three were technological, organizational, and social. The hypothesis was that these inputs would yield specific interactions, activities, and sentiments that result in specific organizational outputs (Seiler, 1967, p. 33). Campbell et al also presented a model emphasizing that person variables impact behavior. In their model, Campbell et al stipulated that behavior resulted from ability, motivation, and opportunity as well as the organizational environment and feedback from previous results (Campbell et al, 1970, p. 11-12). The particular person variables examined in this study included n Ach, leadership orientation, and marginality. Besides examining the effect of organization and person variables on managerial behavior, this research examined certain hypotheses regarding Mintzberg's role concept itself.

Mintzberg's Contingency View of Managerial Work (Figure 1) illustrates that different managers allocate

their time among the various managerial roles differently. Additionally, Mintzberg believed that all of his ten roles would be performed by managers. Adcock (1977) proposed an eleventh role, subordinate, that he believed also existed. These hypotheses were examined in this study. The study examined four primary areas: roles, organization variables, person variables, combined effects, and public versus private. The methodology is presented in this order.

### Roles

Mintzberg argued that managers would perform in all roles though at differing levels due to the effect of environmental, job, person, and situational variables (1973, p. 100-131). To examine this, the following hypothesis was tested:

Null I: The sampling distribution of the managers' responses as a group is uniform among the roles, i.e., the sample was drawn from a multifold population with a uniform probability distribution.

Alternate I: The sampling distribution of the managers' responses, as a group is nonuniform among the roles, i.e., the sample was drawn from a multifold population with a nonuniform probability distribution. (Adcock, 1977, p. 132)

To statistically test this hypothesis, the chi-square test was used. Mathematically:

$$H_0: P_1 = P_2 = \dots = P_{11} = p$$

$$H_a: P_1 \neq P_2 \neq \dots \neq P_{11} \neq p$$

where  $p_i$  would equal the proportion of time spent in each

role. With 11 roles, each  $p_i$  would be expected to equal  $1/11$  for a uniform distribution. The observed  $p_i$  was calculated by dividing the number of observations for role  $i$  by the total number of observations made during the study. The test statistic became

$$\chi^2_c = \sum \frac{(\text{observed} - \text{expected})^2}{\text{expected}}$$

Using an alpha of 0.05,  $\chi^2_c$  with 10 degrees of freedom would be 18.3. Thus if  $\chi^2_o > \chi^2_c$  the null hypothesis was rejected.

Mintzberg (1973) presented ten roles from his study. When Adcock (1977) developed his modified activity sampling methodology, he found that certain activities would not map cleanly to any of the ten roles. He then proposed an eleventh role, subordinate. This study examined the existence of this role and hypothesized

Null V: All the managerial activities and interactions measured can be assigned to one of the existing roles, i.e., no new roles will be discovered.

Alternate V: A significant number of the observations of managers' activities and interactions as a group will not be assignable to one of the existing roles, i.e., the subordinate ( $p_{11}$ ) role will be nonzero. (Adcock, 1977, p. 139)<sup>11</sup>

The actual mathematical hypothesis associated with the above was

$$H_0: p_{11} = 0$$

$$H_a: p_{11} > 0$$

The testing procedure was rather straight forward. Using the observed data, the maximum likelihood estimate of  $p_{11}$  was used to estimate the population parameter. To test whether or not the population parameter was zero, a 95 percent confidence interval was built around the maximum likelihood estimate. To do so, Winkler and Hayes (1975, p. 375) provide the following formula for determining approximate confidence intervals for proportions where  $n$  is large:

$$\frac{R}{n} \pm a \sqrt{\frac{R(n-R)}{n^3}}$$

where

$R$  = number of 'successes', i.e., number of observations of role of interest

$n$  = total number of observations

$a$  =  $1 - (\alpha/2)$  fractile of the standard normal distribution

The last role hypothesis dealt with the existence of all the roles. Mintzberg argued that all the roles existed (1973, p. 54-99). Over the life of the experiment an individual manager, for various reasons, may not perform in all the roles. However, as a group, one would expect all roles to appear. The following was hypothesized:

Null VII: The proportion of responses by the group as a whole among the roles will be zero for one or more roles.

Alternate VII: All the roles will be greater than zero, i.e., there will be no single role in which the group as a whole has no response. (Adcock, 1977, p. 147)

Statistically, this hypothesis was tested the same as Hypothesis V. Instead of examining the subordinate role, however, the role with the fewest observations was examined.

Two different approaches were used in the analysis of the data regarding the effect of the organization and person variables. The first was a univariate analysis of data. Under this approach, the data was partitioned according to individual variables and the resulting subgroups were examined for similarity among roles. The second approach was a multivariate analysis. With this approach, predictions were made for a role while all the variables varied. Multiple linear regressions were used for this analysis.

#### Organization Variables

In the previous chapter, the theoretical and empirical literature concerning hierarchical level in an organization was discussed. Fayol (1916) recognized that managers at differing organizational levels require different abilities. Steiner and Miner (1977) seemed to agree with Fayol when they classified organizational management as strategic (performed at higher levels) and operational (performed at lower levels). From this general literature and specific research, specific hypotheses were developed.

Mintzberg specifically stated that higher level managers would spend more time in the figurehead role.

Adcock confirmed Mintzberg's statement (1977, p. 245). Alexander found that higher level managers perceived that they were required to perform in the figurehead role more than lower level managers (1979, p. 62-63). Pavett and Lau came to the same conclusion (1983, p. 173). Thus, the following hypothesis:

Null II: There is no significant difference in the response distribution among the roles by the group of managers characterized as level 1 (highest level) and the group characterized as level 3 (lowest level).

Alternate II-1: A significant difference exists between the responses of the level 1 managers as a group, and the responses of the level 3 managers as a group, insofar as the figurehead ( $p_1$ ) role. (Adcock, 1977, p. 133)

This hypothesis was based on Mintzberg's Proposition 7: "The lower the level, the more informal the job, and the less time spent in the figurehead role" (1973, p. 130). Alternate II-2 follows:

Alternate II-2: A significant difference exists between the responses of the level 1 managers as a group (highest level) and the level 3 managers (lowest level) insofar as the combination of the disturbance handler ( $p_9$ ) and the negotiator ( $p_{10}$ ) roles. (Adcock, 1977, p. 133-135)

The above hypothesis was derived solely from Mintzberg's Proposition 8 stating

Managers at the lower levels are oriented more directly toward maintaining a steady work flow than those at higher levels; hence, the former spend more time in the real-time roles -- disturbance handler and negotiator. (1973, p. 130)

The above hypotheses tested the effects of the hierarchical level on specific roles.



The next hypotheses explicitly dealt with the line versus staff variable. Again, differences between management practices between functional areas has long been discussed. Weber (1947) argued that managers in different functional areas were required to develop different skills. Parsons (1960) divided managerial work into three functional areas: managerial, institution, and technical systems. More directly related to this study are the works of Stewart (1967) and Pheysey (1972). Both theorized and found that staff managers have their own unique set of requirements. A key issue in this study was defining line and staff.

Boymel examined influence and authority relationships between line and staff in organizations. He presented a classical definition of the two terms used by Theodorson:

organization, line. That segment of a large scale organization such as an industrial corporation that has authority and direct responsibility for the production of goods or services. The line organization consults and is advised by the staff organization.

organization, staff. The staff of specialists and technicians who perform research and advisory services for the line officials or production segment of a formal organization, such as a large industrial corporation. (Boymel, 1982, p. 32)

Though one might prefer that the distinction between line and staff be as clear as the above definitions imply, that is not the case. In fact staff agencies exist in line functional areas and line agencies exist in staff functional areas (Boymel, 1982, p. 33). In operationalizing

these terms in this study, the above definitions were used. Cummings and Berger synthesized the above concepts and their differentiation was applied:

The distinction between line and staff personnel is typically drawn on the basis of task function and type of authority. People involved in the organization's primary output and whose positions are termed 'line' possess command authority, while those whose function only indirectly involves primary output and who advise rather than command are termed staff personnel. The latter are often involved in the coordination, control, and support of line positions. (1976, p. 41)

In the organization sampled, all respondents from the Directorate of Materiel Management were classified as staff since they provide indirect assistance and advise the line managers. Most of the respondents in the Directorate of Maintenance were categorized as line since this organization has the direct responsibility over the output. However, three branches within maintenance were categorized as staff since they provided an advisory service. These were the engineering plans and schedule inventory control branches of the aircraft division and engineering plans branches of the missile and aircraft systems division.

Null Hypothesis III dealt with the line versus staff variable. The hypotheses were based primarily on Mintzberg's Propositions 12 and 14:

12: Line production managers are more oriented toward operating problems, and experience greater fragmentation in their work: They spend more time in the decisional roles, especially disturbance handler and negotiator.

14: Managers of staff specialists spend more time alone, are involved with more paperwork, demonstrate the least amount of fragmentation and variety in their work, spend more time advising outsiders in peer and lateral relationships, and spend considerable time in their specialty functions; they serve as experts as well as managers; and they spend more time in the informational roles, monitor, spokesman, and disseminator. (1973, p. 130-131)

These propositions led to the following hypotheses:

Null III: There is no significant difference in the response distribution among the roles by the group of managers characterized as line and the group characterized as staff.

Alternate III-1: A significant difference exists between the response distribution of line managers and staff managers insofar as the combination of the disturbance handler ( $p_9$ ) and negotiator ( $p_{10}$ ) roles.

Alternate III-2: A significant difference exists between the response distribution of line managers and staff managers insofar as the combination of the informational roles, monitor ( $p_4$ ), disseminator ( $p_5$ ), and spokesman ( $p_6$ ) roles. (Adcock, 1977, p. 137)

Alexander hypothesized that line managers would perceive the decisional roles to be more important than the interpersonal or informational roles. He found this to be true (1979, p. 67-72). Pavett and Lau (1983) found that staff managers rated the monitor role as more important than did line managers (p. 174).

Finally, a hypothesis about the effect of a manager's span of control on how he allocates his time among roles was addressed. Span of control has been addressed for years. Fayol argued that span of control should be limited to 15 workers and that there should be a superior for every

four managers (1916, p. 98). Dennison (1931) argued for a span of six to twelve. Graicunas believed that industrial managers' spans of control were too large and proposed his mathematical formula to determine the proper span (Wren, 1979, p. 386-387). All these theorists imply that as the span of control increases a manager finds more demands on his behavior. The following hypothesis was not based on any of Mintzberg's propositions. As Adcock stated: "The arguments . . . are mainly intuitive" (1977, p. 137). He argued that as the span of control increased, so did the manager's status and required administrative duties. This would thus require more time in the leader role. The increased span of control would also require a manager to spend more time disseminating information. A larger span of control would require a manager to spend more time allocating resources as subordinates compete for the resources. Finally, as the span of control increased, conflicts and disturbances would more likely occur (Adcock, 1977, p. 137-138). These arguments led to the following null and alternate:

Null IV: There is no significant difference between the group of managers whose span of control is 3 or less and the group of managers whose span of control is greater than 3, insofar as the distribution of their responses to the combination of leader ( $p_2$ ), disseminator ( $p_5$ ), resource allocator ( $p_8$ ), and disturbance handler ( $p_9$ ) roles.

Alternate IV: A significant difference exists between the group of managers whose span is 3 or less and the group of managers whose span is greater than 3, insofar as the distribution of their responses

to the combination of leader ( $p_2$ ), disseminator ( $p_5$ ), resource allocator ( $p_8$ ), and disturbance handler ( $p_9$ ) roles. (Adcock, 1977, p. 138-139)

Adcock found the above hypothesis to be true (1977, p. 137-139).

The above Hypotheses II through IV were analyzed using  $X^2$  tests. For these tests, the data was collapsed to binary distributions where the number of observations associated with the roles of interest were successes and all others were failures. The following  $X^2$  statistic was then calculated:

$$X^2_c = \sum_{ij} \frac{(|f_{ij} - g_{ij}| - 0.5)^2}{g_{ij}}$$

where  $f_{ij}$  is the number of observations of role  $i$  in partition  $j$  and  $g_{ij}$  is the expected number of observations of role  $i$  in partition  $j$ . Each  $g_{ij}$  was calculated as follows:  $g_{ij} = \sum_i f_{ij} / N$  for each  $j$  where  $N$  equals the total number of observations.

Hypothesis VI presented a multiple regression equation to be applied to each of the 11 roles.

Null VI: The relationship

$$p_{ij} = B_0 + B_1X_1 + B_2X_2 + B_3X_3 + B_4X_4 + B_5X_5 + B_6X_6 + e$$

where,

$p_{ij}$  = estimate of time spent in  $i^{\text{th}}$  role by respondent  $j$

$B_0$  to  $B_6$  = regression coefficients

$X_1$  = 1 if the respondent is assigned to organization level 2; 0 otherwise

$X_2 = 1$  if the respondent is assigned to organization level 1; 0 otherwise

$X_3 = 1$  if the respondent is on staff

$X_4 = 1$  if the respondent has a span equal to 1 (3 - 6); 0 otherwise

$X_5 = 1$  if the respondent has a span equal to 2 ( $\geq 7$ ); 0 otherwise

$X_6 =$  total number of employees reporting to the respondent

$e =$  error

will not be significant in explaining the intra-role variability for any one of the eleven roles.

Alternate VI-1: The relationship will be significant for the figurehead ( $p_1$ ) role.

Subalternate VI-1.1: In this significant relationship,  $B_2$  will be greater  $B_1$  and  $B_1$  will be greater than the baseline.

Alternate VI-2: The relationship will be significant for the disturbance handler ( $p_9$ ) role.

Subalternate VI-2.1: In this significant relationship,  $B_2$  will be less than  $B_1$  and  $B_1$  will be less than the baseline.

Subalternate VI-2.2: In this significant relationship,  $B_5$  will be greater than  $B_4$  and  $B_4$  will be greater than the baseline.

Subalternate VI-2.3: In this significant relationship,  $B_6$  will be greater than zero.

Alternate VI-3: The relationship will be significant for the negotiator ( $p_{10}$ ) role.

Subalternate VI-3.1: In this significant relationship, the absolute value of  $B_1$  will be significantly different from the baseline but the coefficient will be negative and the absolute value of  $B_2$  will be greater than  $B_1$  but the sign

of  $B_2$  will be negative. Also, the coefficient of  $B_3$  will be significant and negative.

Alternate VI-4: The relationship will be significant for the monitor ( $p_4$ ) role.

Subalternate VI-4.1: In this significant relationship, the coefficient  $B_3$  will be greater than zero.

Alternate VI-5: The relationship will be significant for the disseminator ( $p_5$ ) role.

Subalternate VI-5.1: In this significant relationship, the coefficient  $B_3$  will be greater than zero.

Subalternate VI-5.2: In this significant relationship, the coefficient  $B_5$  will be greater than  $B_4$  and  $B_4$  will be greater than the baseline.

Subalternate VI-5.3: In this significant relationship, the coefficient  $B_6$  will be greater than zero.

Alternate VI-6: The relationship will be significant for the spokesman ( $p_6$ ) role.

Subalternate VI-6.1: In this significant relationship, the coefficient  $B_3$  will be greater than zero.

Alternate VI-7: The relationship will be significant for the leader ( $p_2$ ) role.

Subalternate VI-7.1: In this significant relationship, the coefficient  $B_5$  will be greater than  $B_4$  and  $B_4$  will be greater than the baseline.

Subalternate VI-7.2: In this significant relationship, the coefficient  $B_6$  will be greater than zero.

Alternate VI-8: The relationship will be significant for the resource allocator ( $p_8$ ) role.

Subalternate VI-8.1: In this significant relationship, the coefficient  $B_5$  will be greater than the baseline.

Subalternate VI-8.2: In this significant relationship, the coefficient of  $B_6$  will be greater than zero. (Adcock, 1977, p. 140-142)

Each of the alternate and subalternate hypotheses are explained. First, the baseline for the above was a level 3 manager (lowest level), in the line function, category zero span of control (2 or less), and no subordinates reporting directly to him. Span category one consisted of a span of 3 to 6. Span two was a span of 7 or more.

Alternate hypothesis VI-1 dealt with the figurehead role. The hypothesis stated that the highest level managers (level 1) spend significantly more time in the figurehead role than the lower level managers and that the middle-level managers (level 2) spend more time in the role than the low-level managers.

Alternate hypothesis VI-2 dealt with the disturbance handler role. One is stating that as the span of control increases, the time in the disturbance handler role increases. Likewise, as the number of subordinates increases, the time in the disturbance handler role increases. Finally, as the hierarchical level increases less time will be spent in this role. The arguments for each of these subalternate hypotheses has been explained previously when the corresponding univariate hypothesis was presented. However, there were no univariate



hypotheses dealing with the number of subordinates. The arguments used for the effect of number supervised are very similar to those for span of control. As the number increases a manager finds himself with more disturbances to address.

Alternate Hypothesis VI-3 looked at the intra-role variability associated with the negotiator role. In this case, one expected lower-level managers to spend more time in the negotiator role than higher level managers. Additionally, to accept the alternate hypothesis, the line managers must spend significantly more time in the negotiator role than the staff managers.

The monitor role is the subject of Alternate Hypothesis VI-4. The subalternate stated simply that the staff manager spends more time in the monitor role than the line manager.

Alternate Hypothesis VI-5 dealt with the disseminator role. Again, since staff members are hypothesized to spend more time in the informational roles than line managers, Subalternate VI-5.1 was written. Subalternate VI-5.2 allowed for the hypothesis that as span of control increased so did time in the disseminator role. Finally, Subalternate VI-5.3 hypothesized that as the size of the unit supervised increased so did time in the disseminator role.

Since staff managers are hypothesized to spend more time in the spokesman role, Hypothesis VI-6 was developed.

As the span of control and the size of the unit supervised increased, a manager was expected to spend more time in the leader role. Alternate Hypothesis VI-7 and its subalternates test for this relationship.

Finally, Alternate Hypothesis VI-8 dealt with the resource allocator role. They hypothesized relationships the same as for VI-7 (Adcock, 1977, p. 142-146).

The foregoing discussion has summarized the hypotheses tested. After testing the above hypotheses, additional hypotheses concerning the person variables were tested. This part of the research accomplished Objectives 1a and 1b. The next section addresses Research Objective 3.

#### Person Variables

Hypotheses are presented in the same format as for the organization variables, and the same univariate and multivariate statistical tests were used. The Model of Organizational Behavior (Figure 2) served as the conceptual basis for examining personal input variables.

Just as the organizational inputs affect role behavior, so it was hypothesized the personal inputs would. Individuals attracted to an organization bring with them their skills, abilities, motives, values, and self-image. There obviously will be some degree of interaction between the organization and individuals attracted to it.

Generally, military organizations will be attractive to certain people and not to others. One's particular personal make-up will affect the activities one chooses to engage in. Likewise, that individual make-up will affect who one interacts with. These two factors, as illustrated in Figure 2, determine the role one is engaged in. Personal variables have been examined by many who believe that personal variables affect behavior. Campbell et al (1970) concluded that as much as 30 to 50 percent of variance in managerial performance resulted from individual differences. Stewart (1976) also concluded that the pattern one sees as a manager performs his work results both as a result of the job and of choice (p. 37). Though some hold the position that managerial behavior is more a response to job/organizational situations, the position taken here is that one must believe that behavior is a function of both the environment and the individual. There are intrinsic differences between individuals and these interacting with environmental variables produce behavior (O'Reilly, 1977; Seiler, 1967).

The goal of research then is to lay out empirically the relations expounded by theory. The primary goal of this research was to examine empirically the relationship between specific person variables and role behavior as expressed in Adcock's Model of Organizational Behavior based on the work of Seiler and Campbell et al. Specifically,

the expanded micro-model examined is presented in Figure 6. Two of the variables - n Ach and leadership orientation - have been discussed and researched extensively in the management literature. Each variable is discussed in turn, and hypotheses for each are presented.

The first person variable selected was marginality. Ziller, Stark, and Pruden defined marginality as ". . . a personality orientation by which environmental information is translated into personal meaning through individuals' perceived representation of themselves in relation to significant others" (p. 489). Thus, the marginal individual sees himself as not belonging to significant other groups. This ability then allows the marginal individual to be 'open-minded' - a fact supported by a negative correlation between marginality and dogmatism (Ziller et al, 1969, p. 493; Cotton, 1977, p. 134). As a result of these characteristics, research has shown that marginal individuals have the skills of integrators who must seek to achieve a unity of effort among different groups (Lawrence and Lorsch, 1967) by being open-minded and having adaptable information processing capacities. Liddell pointed out that marginal individuals are more adept at resolving intergroup conflict (1973, p. 156). This leaves one with the view of the marginal individual as open-minded and non-dogmatic with adaptable information processing capacities. Unfortunately, this view does not directly translate

into specific, observable behaviors. Thus, the following arguments are highly intuitive.

One obvious behavior that could be expected of a marginal individual relates to his open-mindedness. Being open-minded, requiring varied knowledge, and being objective, one could reasonably expect him to be seeking information. The marginal individual then would be expected to spend more time in the monitor role than his non-marginal counterpart. The next proposition about marginal individuals is not as direct. Possessing the characteristics of a marginal individual, one may for various reasons gravitate toward handling certain managerial activities. Thus, the marginal individual may find himself, more so than non-marginal individuals, involved in crisis handling and budgeting and resource allocation decisions. Therefore, the marginal individual could be expected to spend more time in the disturbance handler and resource allocator roles.

Null VIII: There is no significant difference in the response distribution among the roles by the group of managers characterized as non-marginal and marginal.

Alternate VIII-1: A significant difference exists between the responses of the marginal managers as a group and the non-marginal managers as a group regarding the monitor ( $p_4$ ) role.

Alternate VIII-2: A significant difference exists between the responses of the marginal managers as a group and the non-marginal managers as a group regarding the combination of the resource allocator ( $p_8$ ) and disturbance handler ( $p_9$ ) roles.

To measure marginality, Ziller's Self-other Orientation instrument was administered (Appendix A). Each respondent received a score of zero to four on this test as only questions 2, 4, 8, and 11 were scored. Ziller argued that marginality is a dichotomous rather than continuous variable (1977, p. 136). As such, three categories were established. Subjects scoring zero or one were classified as non-marginal while those scoring three or four were classified as marginal. That left those scoring two as indeterminate. However, it was anticipated that very few, if any, subjects would score two since marginality is dichotomous. This in fact was the case as only two respondents were classified as indeterminate (See Table 28).

The second person variable examined was leadership orientation. This variable was chosen primarily because of the extensive management literature on the subject, this researcher's interest in leadership, and because it is the only person variable discussed by Mintzberg (1973). Mintzberg presented six basic purposes managers must serve (p. 95-96). Two of these relate directly to the leader role:

2. The manager must design and maintain the stability of his organization's operations. The manager must program the operations of his organization and monitor these programs to insure a steady pattern of workflow. He must correct deviations when they occur and he must allocate new resources, as they become available, to ensure the smooth flow of operations. As leader, he must develop and sustain an atmosphere in which the necessary work will get done. . . .

3. The manager must take charge of his organization's strategy-making system, and therein adapt his organization in a controlled way to its changing environment. As monitor, the manager must be familiar with environmental trends and as entrepreneur and leader he must provide direction for his organization and introduce change in such a way that the organization adapts to it without unnecessary disruption. (1973, p. 95)

Purpose three is comparable to the activities normally ascribed to the task-oriented leader while purpose two allows for the relationship-oriented view in the term 'atmosphere'.

Mintzberg himself argued that though a large amount of research has been done on the style of leadership, nothing has of yet been done with style and actual work performed. That which has been done tried to link style with effectiveness. Mintzberg stated that ". . . we may be able to learn much of interest by studying the effect that the personality and style of the incumbent have on the work performed" (1973, p. 119).

Since this study is primarily concerned with behaviors, task-orientation versus relationship-orientation was examined since it is possible to associate behaviors with each of these styles. These behaviors in turn are mapped onto roles.

The task-oriented leader typically acts to organize and define roles within the group, to explain what activities each member should do and when, where, and how tasks are to be accomplished, and to establish well



defined patterns of organization, channels of communication, and ways to get the job done (Fiedler and Chemers, 1974; Rice, 1978; Yukl, 1981). Other activities which the task-oriented leader would engage in consist of making plans, formulating procedures, setting standards, assigning and organizing work, evaluating performance, and scheduling work.

The relationship-oriented leader on the other hand is concerned primarily with maintaining personal relationships between himself and subordinates by opening up channels of communication, providing socioemotional support, and facilitating behavior; showing concern, understanding, warmth, and sympathy for the feelings and opinions of his subordinates; being considerate of subordinates' needs; and being willing to explain his behavior (Fiedler and Chemers, 1974; Rice, 1978; Yukl, 1981). Obviously, identifying specific activities as relationship-oriented can be difficult.

May (1979) observed the activities of university media services directors and devised some functional roles that provide some additional insight. May identified two leader roles: organizational and spirit. Activities that identify the organizational leader, comparable to task-oriented, consisted of authorization requests, influence requests, director's request for follow-up and delegation, proof/sign mail, operational/functional reviews, reports

on operations, schedule preparation, meeting/agenda preparation, personnel evaluation, and reprimanding or commending staff. The spirit leader role consisted of the following activities: giving advice; handling crisis strategy; providing acknowledgements; handling problems/pressures; conducting tours; motivating; and being a confidant, supporter, or critic (p. 201, 218-219, 221-222). Though some of the categorizations used by May do not fit the typical concept of task-oriented or relationship-oriented, his categorization can aid in determining the affect leadership orientation has on managerial behavior.

Since this study examined task-oriented and relationship-oriented leadership styles, it was also necessary to designate each mapping to the leader role as either task leader or relationship leader role. Thus, each mapping to the leader role was examined. Using the previously mentioned studies that related actual behavior to style (Fiedler and Chemers, 1974; Rice, 1978; Yukl, 1981; May, 1979), each activity mapped to the leader role was mapped to either the task leader or relationship leader role. These are listed in Table 9. The leader role consisted of two subroles, relationship leader and task leader. With the revised mapping, one can generally say that a task-oriented individual would spend more time in the task leader and disseminator roles than will a relationship-

Table 9

## Mapping Changes

Management Activity	Previous Role	Changed Role
Respondent requests subordinate to initiate something for influence to investigate to follow-up for action for a favor	Leader Leader Leader Leader Leader Leader	Task Leader Relationship Leader Task Leader Task Leader Relationship Leader
Subordinate or boss asks respondent for influence	Leader	Relationship Leader
Subordinate asks respondent for action a favor	Leader Leader	Relationship Leader Relationship Leader
Peer, employee-other, or outsider asks respondent to initiate something	Leader	Relationship Leader
Deputy review with a subordinate	Leader	Relationship Leader
Deputy review with a combination	$\frac{1}{2}$ Leader $\frac{1}{2}$ Subordinate	$\frac{1}{2}$ Relationship Leader $\frac{1}{2}$ Subordinate

Table 9 (con't)

Management Activity	Previous Role	Changed Role
New-man or other review with a subordinate	½ Leader ½ Disseminator	½ Relationship Leader ½ Task Leader ½ Disseminator
Functional review with a combination	½ Leader ½ Entrepreneur	½ Task Leader ½ Entrepreneur
Personnel administration training/certification termination/lay off hiring/interview performance review/commendation discipline/reprimand salary/wage adjust/approve time change award recommendation other	Leader Leader Leader Leader Leader Leader Leader Leader Leader Leader	Task Leader Task Leader Task Leader Task Leader Task Leader Task Leader Task Leader Task Leader Task Leader Task Leader Relationship Leader Task Leader

oriented leader. Additionally, a relationship-oriented person will spend more time in the relationship leader role.

One should logically expect a task-oriented manager to spend more time in the activities designated as task leader. Likewise, one would logically expect a relationship-oriented manager to spend more time in the relationship leader role. However, the suppositions are only true if, in fact, the individual has control over his activities. If the job/task controls his activities, the manager may not spend more time in the leader role corresponding to his leadership orientation. Activities typical of a task leader role consist of organizing and defining roles, explaining activities, establishing ways to get the job done, assigning and scheduling work. All these activities require the dissemination of information. Thus, the following hypotheses were tested:

Null IX: There is no difference in the response distribution among the roles by the group of managers characterized as task-oriented and the group characterized as relationship-oriented.

Alternate IX-1: A significant difference exists between the response distribution of task-oriented and relationship-oriented managers regarding the combination of task leader ( $p_{2b}$ ) and disseminator ( $p_8$ ) roles.

Alternate IX-2: A significant difference exists between the response distribution of task-oriented and relationship-oriented managers regarding the relationship leader ( $P_{2a}$ ) role.

Fiedler's Least Preferred Co-worker Questionnaire was selected to measure leadership orientation. Though

some question what the instrument measures (Rice, 1978), one can argue as Rice himself agrees that

. . . the present review strongly supports the proposition that responses to the LPC scale can be used to classify persons as task oriented or relationship oriented. (1973, p. 1231)

The instrument is included in Appendix B and consists of 16 sets of dichotomous adjectives. The respondent thinks of his least preferred co-worker and checks the appropriate line between the two adjectives. Each check receives a score from one to eight. A low score of 16 would indicate a task-oriented respondent while a high score of 128 would indicate relationship-orientation. Fiedler advises that task-oriented respondents score from 1.2 - 2.2 using an average for the 16 responses while relationship-oriented respondents score from about 4.1 - 5.7. Thus, for this study respondents scoring 35 and below were categorized as task-oriented while those scoring 66 and above were categorized as relationship-oriented. The LPC instrument also has a distinct advantage in that it is short and easy to complete. This met one of the requirements established for instrument selection.

The final person variable examined was n Ach. This variable has been examined over the years and considered a desirable trait for managers to possess (Campbell et al, 1970, p. 7). The basis of the need theory of motivation is that an individual with high n Ach will act when he perceives certain behaviors as leading to achievement

feelings. Hampton et al (1978) characterized an individual with high n Ach as predisposing

. . . the individual to engage in setting goals, trying to improve performance to reach goals, and realistically seeking and using feedback on performance; n Achievement has no emphasis on people. (p. 17)

Consequently, high n Ach individuals would tend toward entrepreneurial activities. Thus, the entrepreneur acts to find better ways of doing things to get ahead and obtain personal satisfaction. McClelland (1961) stated:

Probable common term between n Achievement and entrepreneurship was a similar interest in situations involving moderate risk or maximum opportunity of getting personal achievement satisfaction without running undue risk of failure. (p. 59)

Mintzberg (1973) himself ties this together in providing the basis for the next hypothesis. He listed eight managerial job types. One was the entrepreneur. This man is characterized as spending a good part of his time seeking opportunities and implementing changes in his organization. He spends much of his time in the entrepreneur role and the negotiator role to implement his proposed changes.

Null X: There is no significant difference in the response distribution among the roles by the group of managers characterized as having a high n Ach and those with a low n Ach.

Alternate X: A significant difference exists between the responses of the high n Ach managers as a group and the responses of the low n Ach managers as a group regarding the combination of the entrepreneur (p<sub>7</sub>) and negotiator (p<sub>10</sub>) roles.

The Adjective Check List (ACL) was used to measure n Ach. The ACL assesses over 20 personality traits of which n Ach is one. The test takes only 10-15 minutes to complete. The ACL includes 300 adjectives that are typically used to describe the attributes of a person (Andrulis, 1977, p. 124). The test scoring allows dividing respondents into n Ach categories. Three were to be used. A standard scor of 40 or less was to be classified as low n Ach, of 60 or more to be high n Ach, and the remainder as indeterminate (Gough and Heilbrun, 1980, p. 48). The respondents' scores on the test did not include any scores below 40, thus the low n Ach score was changed to 50 or below. As Steers reported, n Ach as measured by the ACL is highly related to achievement on the California Psychological Inventory. Additionally, the stability coefficients on the N Ach measure for men and women were 0.81 and 0.74 respectively (Steers, 1975, p. 396). The ACL also offers three methods of detecting respondents who are not sincere, i.e., randomly checking adjectives (Gough and Heilbrun, 1980, p. 5, 7, 31). These rules were used to determine if any respondents should be eliminated from the research effort; however, none of the respondents' scores indicated that they should be eliminated.

The basic format of Hypothesis XI was the same as Hypothesis VI with additional variables to account for the personal variables.



Null XI: The relationship

$$P_{ij} = B_0 + B_1X_1 + B_2X_2 + B_3X_3 + B_4X_4 + B_5X_5 + \\ B_6X_6 + B_7X_7 + B_8X_8 + B_9X_9 + B_{10}X_{10} + B_{11}X_{11} \\ + B_{12}X_{12} + e$$

where,

$P_{ij}$ ,  $X_1$  to  $X_6$ , and  $e$  are the same as for Null VI

$X_7 = 1$  if respondent is classified as indeterminate regarding marginality; 0 otherwise

$X_8 = 1$  if respondent is classified as marginal; 0 otherwise

$X_9 = 1$  if respondent is classified as indeterminate regarding leadership orientation; 0 otherwise

$X_{10} = 1$  if respondent is classified as relationship-oriented; 0 otherwise

$X_{11} = 1$  if respondent is classified as indeterminate regarding n Ach; 0 otherwise

$X_{12} = 1$  if respondent is classified as high n Ach; 0 otherwise

will not be significant in explaining the intra-role variability for any one of the thirteen roles.

Alternate XI-1a: The relationship will be significant for the relationship leader ( $p_{2a}$ ) role.

Subalternate XI-1a: In this significant relationship,  $B_{10}$  will be greater than the baseline.

Alternate XI-1b: The relationship will be significant for the task leader ( $p_{2b}$ ) role.

Subalternate XI-1b: In this significant relationship,  $B_{10}$  will be negative.

Alternate XI-2: The relationship will be significant for the monitor ( $p_4$ ) role.

Subalternate XI-2: In this significant relationship,  $B_8$  will be greater than the baseline.

Alternate XI-3: The relationship will be significant for the disseminator ( $p_5$ ) role.

Subalternate XI-3: In this significant relationship,  $B_{10}$  will be negative.

Alternate XI-4: The relationship will be significant for the entrepreneur ( $p_7$ ) role.

Subalternate XI-4: In this significant relationship,  $B_{12}$  will be greater than the baseline.

Alternate XI-5: The relationship will be significant for the resource allocator ( $p_8$ ) role.

Subalternate XI-5: In this significant relationship,  $B_8$  will be negative.

Alternate XI-6: The relationship will be significant for the disturbance handler ( $p_9$ ) role.

Subalternate XI-6: In this significant relationship,  $B_8$  will be greater than the baseline.

Alternate XI-7: The relationship will be significant for the negotiator ( $p_{10}$ ) role.

Subalternate XI-7: In this significant relationship,  $B_{12}$  will be positive.

The baseline for the above multiple regression analysis was the same as for Hypothesis VI except that the person variables were added. In Hypothesis XI, the baseline was expanded to include the task-oriented, non-marginal, low n Ach respondent.

Alternate XI-1a simply stated that the time a respondent spends in the leader role is a function of leadership orientation. Since the baseline was task-orientation and one can expect a relationship-oriented

individual to spend more time in the relation leader role,  $B_{10}$  should be greater than zero since  $B_{10}$  represented the difference between task-oriented and relationship-oriented managers. Likewise, Alternate XI-1b stated that the task-oriented manager spends more time in the task leader role. Therefore,  $B_{10}$  should be negative to reduce the time in that role for a relationship-oriented manager.

The regression coefficient  $B_8$  represented the difference between the amount of time a marginal and non-marginal (base-line) individual would spend in a role. Consequently, since marginal individuals are more open-minded and willing to consider various viewpoints, Alternate XI-2 stated that the marginal individual spends more time in the monitor role, thus  $B_8$  was expected to be positive.

Since task-oriented individuals provide more direction and insure they clarify roles, one would expect task-oriented respondents to spend more time in the disseminator role. Thus Alternate XI-3 was presented. Since the task-oriented individual was the baseline,  $B_{10}$  which was the difference between the task and relationship orientation should have been negative.

Since those individuals with high  $n$  Ach are characterized as seeking better ways to accomplish tasks, Alternate XI-4 was presented. Since a low  $n$  Ach served as baseline,

$B_{12}$  should have been positive for the entrepreneur regression.

Likewise, marginal managers may be called on more often to allocate resources due to the manager's ethnocentric characteristics. Thus,  $B_8$  should be negative since the non-marginal manager served as the baseline.

Alternate XI-6 again was concerned with the marginality variable. Since marginal individuals are more able to view both sides of a point, they may be required more often to handle disturbances. Since the non-marginal individual is the baseline,  $B_8$  which represents the difference between non-marginal and marginal individuals was expected to be positive.

The final Alternate XI-7 dealt with the negotiator role. As stated by Mintzberg (1973), the entrepreneur, characterized by a high n Ach, spends more time in the negotiator role to sell his new ways of doing things. Since the baseline was low n Ach,  $B_{12}$  was expected to be positive.

#### Combined Effects

A word about combined affects is required. In this research with three hierarchical levels, three spans of control, line versus staff, number of employees supervised, three leader orientations, three n Ach categories, and three marginality levels, there are many possible combined effects. Obviously, one could not examine all

of them. Two were examined: marginality and first line supervisory level and high n Ach and middle-level management. These were selected because they are the most commonly discussed combinations in the literature reviewed.

In examining the literature on marginality, one quickly realizes that

A considerably concentration of marginality has already happened - probably by trial and error - in sales, purchasing, labor relations, and first-line supervision. (Cotton, 1977, p. 136)

Research has supported Cotton (Wray, 1949; Ziller et al, 1969). Since this research examined levels of management as well as marginality, a possible combination effect existed.

Null XII: There is no significant difference in the response distribution among the roles by the group of managers characterized as marginal, first line supervisors and all others.

Alternate XII-1: A significant difference exists between the responses of the marginal, first line supervisors as a group and all others regarding the monitor ( $p_4$ ) role.

Alternate XII-2: A significant difference exists between the responses of the marginal, first line supervisors as a group and all others regarding the combination of the resource allocator ( $p_8$ ) and disturbance handler ( $p_9$ ) roles.

McClelland's (1961) research indicated a potential combination effect between n Ach and hierarchical level (p. 267-268). It appears that middle-level managers have a higher n Ach than lower- or upper-level managers.

Null XIII: There is no significant difference in the response distribution among the roles by

the group of managers characterized as high n Ach, middle-level and all others.

Alternate XIII: A significant difference exists between the response of the high n Ach, middle-level managers as a group and all other managers as a group regarding the combination of the entrepreneur (p<sub>7</sub>) and negotiator (p<sub>10</sub>) roles.

Other possible combination effects do exist. Cotton (1977) proposed a possible relationship between marginality and high n Ach. Hampton et al (1978) indicated a possible relation between high n Ach and task-orientation (p. 71). Other research has supported a negative relationship between marginality and middle-level management and staff position. Having examined the organization and person variables, the issue of public versus private is addressed next.

#### Public versus Private

Differences between management in the private and public sectors have been discussed for years. There are those who have argued that management in these sectors is different since the sectors differ. Rainey et al argued that the two sectors differ on three factors: environmental, organization-environment transactions, and internal structures and processes (1976, p. 235-241). Table 2 itemized these differences. McCurdy found that federal employees worked in jobs similar to those in private firms (1978, p. 573). Vorwerk (1979) undertook an observational study of public managers and compared

his results to those done in studies of managers in the private sector. He found very little difference between management in the two sectors. Lau et al (1980) compared perceptions of work using Mintzberg's role concept. They compared the perceptions of civilians working for the U.S. Navy to managers in the private sector of southern California. Again, very little difference was found.

To answer Research Hypothesis 2, the following statistical hypothesis was tested:

Null XIV: Managers in the public sector and managers in the private sector distribute their time among roles the same.

Alternate XIV: Managers in the public sector and managers in the private sector distribute their time among roles differently.

The actual number of overall observations for each role in this study was compared to the number in Adcock's (1977) study. A  $X^2$  test was performed using a critical  $X^2$  value at the 5 percent level with 10 degrees of freedom.

The above statistical tests provided the answers to the Research Hypotheses. This research expanded on Adcock's work in two ways: it examined personal variables and it examined managers in the public setting. The next section describes the sample used in this study.

## SAMPLING

For this study, managers in a USAF ALC were studied. There are five ALCs in the USAF. These organizations are very large - approximately 16,000 people - and manage the logistics support of major military weapon systems. Consequently, managerial requirements run the gamut from technical to institutional with foremen to a commanding major general. The sample is described first followed by a description of the sampling procedures and the results of those procedures.

Air Logistics Center

An ALC is an organization responsible to Headquarters Air Force Logistics Command (HQ AFLC) at Wright-Patterson Air Force Base (WPAFB), Ohio. An ALC's mission is divided into three major areas: system management, commodity or item management, and geographic support. Each ALC manages several weapon systems.

These weapon systems include bombers, fighters, missiles, etc. used throughout the Air Force and world. These weapon systems are assigned to major air commands such as the Tactical Air Command, Pacific Air Forces, Air Forces in Europe, Alaskan Air Command, the Air National Guard, Air Force Reserve, and Air Force Systems Command.



Each ALC is also responsible for the logistics support of various commodity groups. The commodity groups managed can include such things as landing gear, photographic and reconnaissance equipment, airmunitions, communications-electronics equipment, avionics equipment, and others for all weapon systems.

To meet their mission requirements, an ALC is a highly industrialized activity consisting of a management center, a contracting agency, a distribution complex, an industrial plant with extensive engineering and repair activities, and a data automation center to handle the over 150 management information systems which provide data to all levels of management and allow the integration of all the ALC's activities. Over 19,000 military and civilian personnel with a combined payroll of over \$421 million work at the ALC studied.

The ALCs have a Directorate of Plans and Programs which serves as the principal staff advisor to the ALC commander. The directorate develops and implements policy and plans and assists the ALC commander in his planning for management of all resources - people, facilities, equipment, energy, and dollars.

The Directorate of Contracting and Manufacturing reviews and processes all contracts for the ALC. These contracts are roughly \$1.5 billion annually at each ALC.

The Directorate of Distribution serves as a link between the source of supply and the ultimate consumer. They must insure that the right parts are in the right place at the right time. This directorate handles hundreds of thousands different items in the Air Force inventory. This involves receiving, storing, issuing, packaging, transporting, and controlling material in both a wholesale and retail environment.

The other Directorates - Materiel Management and Maintenance - were of particular interest to this study. The sample was drawn from these two directorates. Thus, these directorates are discussed in more detail.

#### Directorate of Materiel Management

The Directorate of Materiel Management is the hub of the ALC logistics management activities. It provides the interface between internal activities and customers. They interface with all other directorates. They issue purchase requests to the Directorate of Contracting and Manufacturing, distribution orders to the Directorate of Distribution, and repair and modification projects to the Directorate of Maintenance.

A directorate has approximately 2,000 people assigned to carry out its mission. One of its most important functions is to determine future requirements for materiel, services, and modifications for the systems and commodities it manages. These requirements are used by the directorate

to determine budget, financial, and other plans. The requirements are also provided to the other directorates so that they may compute their workloads.

In fact the sampled directorate administers over \$5.44 billion of funding a year in support of its weapon systems and commodities. Besides systems management and item management divisions in the directorate, other divisions contribute to the directorate mission accomplishment.

The Engineering Management Division provides engineering services to the system and item managers in the directorate. The Resource Management Division administers the directorate's budget and funding, plans and programs, policy and procedures, manpower, facilities, and training activities. The following statistics are provided to give an impression of the size and scope of the directorate's activities.

The directorate's total major funding programs sum to \$1.7 billion. Manning is over 2900 personnel - military and civilian. With this view of the Directorate of Materiel Management, the Directorate of Maintenance is examined next.

#### Directorate of Maintenance

The directorate provides a major portion of the ALC's support efforts. Over 6,000 individuals are employed at the sampled directorate with a payroll of over \$175 million dollars. The directorate's annual operating

budget is over \$280 million dollars while the equipment and facilities are valued at over \$260 million. The directorate is divided into three main product divisions and associated product support divisions.

There is a Resource Management Division that manages all the industrial resources for the maintenance complex. Their primary responsibilities are budget of the depot maintenance industrial fund expenditures, manpower use, planned workload, long range planning and acquisition, and depot maintenance field team support.

The Industrial Systems Engineering Division has management responsibility for the preparation of directorate policy to insure the effective implementation of engineering and industrial systems. Additionally, this division controls materiel handling, insures operational integrity of all industrial systems, and manages the productivity and behavioral science programs as well as internal inspections.

The Maintenance Management Systems Division is a data system design group that develops and implements a material support system for all AFLC maintenance directorates. The division also develops management information systems and is responsible for testing and prototyping the maintenance data collection system.

The Quality Assurance Division assures that products conform to the user's serviceability specifications.

The Facilities and Equipment Management Division provides plant engineering aspects for inclusion in the military construction and maintenance operations programs, maintenance of the industrial plant, managing the directorate's transportation, material handling and depot plant equipment functions, as well as the directorate's contract maintenance and contractual services programs. The actual maintenance performed is broken down into three major categories corresponding to the weapon systems supported.

The directorate is a high volume, highly technical, diversified industrial operation. The magnitude of the effort can be seen by the quantities of major workload items produced per month: 36 major weapons and 15,588 other end items. With this description of the two directorates sampled in this study, the sample can be described.

#### The Sample

An objective of this study was to look at the differences between how staff and line managers spent their time while working. Thus, it was decided to sample from the Directorates of Materiel Management and Maintenance. These two directorates are also the primary directorates within an ALC. All of the personnel from the Directorate of Materiel Management were classified as staff while most of the personnel from the Directorate of Maintenance

were categorized as line with a few classified as staff. The three Maintenance branches classified as staff were engineering plans, schedule inventory control, and engineering plans.

Prior to data collection, this researcher was provided a point of contact at the ALC to assist in establishing the data collection procedures and to serve as an intermediary during data collection. This individual worked in the Civilian Personnel Office and held a Ph.D. in Industrial and Organizational Psychology. Prior to the researcher's arrival, a random list of both civilian and military managers in both directorates had been prepared. The individuals were contacted by letter and asked to participate in the study. Twenty-eight individuals agreed to participate. For reasons to be explained later, one individual's responses were dropped from the study. The responses from the remaining 27 individuals served as the data for this study. The sample was varied as seen in the following description. Of the 27 respondents, 12 were classified as line while 15 were classified as staff managers. Three managers were grouped in level 1 (the highest), seven at mid-level, and 17 at the lowest level. The span of control varied from zero (3 respondents) to 27. The mean span of control was 10.67 with a median value of 12. The total number of subordinate employees varied from zero to 6780 with a mean of 308.26 and a

median value of 18. For information on the individual respondents on the following variables, see Table 10. The sample consisted of 25 males and 2 females. The ages ranged from 31 to 59 with a mean of 44.74. Time serving in DOD ranged from 8 to 38 years with an average of 20.21 years. Time serving at the ALC ranged from 2 weeks to 36 years with an average of 14.11 years while the time in the current position ranged from 2 weeks to 7 years with an average of 1.98 years. The rank of the military respondents ranged from captain to colonel while the civilians ranged from WS-9 (wage supervisor) to GM-13 (general manager).

#### Data Collection

With the respondents already selected, the researcher arrived at the ALC. A meeting was held from 0800 to 1100 hours on Tuesday, 17 August 1982. At this meeting, respondents were briefed on the procedures to be used for the data collection. To guarantee anonymity, the respondents were provided respondent numbers by the intermediary. He also handed out telephone pocket pagers that were to be used to collect the data. He told the respondents to contact him directly should they have any problems with their pocket pager. Contacting the researcher would void the anonymity. Each respondent was also given four days supply of Management Activities

Table 10  
Sample Description

Respondent Number	Sex	Age	Rank	Time in (years)		Current Position
				DOD	ALC	
1	M	48	GS-13	27	27	2.5
2	M	35	GS-13	14	10	2
3	M	33	WS-10	12.5	12.5	3.25
4	M	58	GS-12	35	32	3
5	M	34	WS-10	13	10	.10
6	M	45	GM-13	16	16	4
7	M	38	Major	14.75	.04	.04
8	M	55	GS-12	20	20	2.5
9	M	35	WS-10	15	15	2
10	F	44	GM-13	26	6.5	.75
11	M	45	GM-13	22	22	.67
12	M	43	Colonel	21	.12	.12
13	M	44	Lt Col	24	3	.92
14	M	59	GS-12	14	14	2.5
15	M	58	WS-16	38	36	3
16	M	54	GS-12	32	30	7
17	M	42	WS-11	24	20	2
18	M	53	GS-14	14	12	.33
19	M	36	WS-10	17	17	5
20	M	46	Colonel	24	.04	.04
21	M	35	GS-13	14	10	2
22	M	31	WS-9	8	8	2
23	M	51	GM-13	31.5	27.5	1
24	M	54	WS-10	16	8	1.5
25	F	31	Captain	8	1	1
26	M	54	WS-13	31	17	2
27	M	35	Captain	13	1.17	1.17



Forms. After the numbers and pagers were assigned, the respondents were briefed on how to record the data.

Each category of the form was covered and definitions were explained. Questions were answered to allow clarification. Respondents were advised not to complete a form if they were signaled when not doing managerial work. A list of definitions were provided to the respondents. They were advised to refer to it frequently. Unknown to the respondents, the initial responses were not included in the study. Instead, the first day responses were reviewed and errors were noted. A synopsis was written and sent to each respondent. Additionally, a second meeting was set up for 1300 the next day to answer questions after the respondents had one day to try the data collection procedures. Also, responses were reviewed as they came in. If a respondent was consistently making errors or forms were not being returned, the researcher provided feedback through the intermediary to allow for correction.

The exact procedures used to collect the data were as follows. A contract was let with a local answering service to page respondents. Over the duration of the data collection period, the answering service would signal a respondent each minute of the day from 0700 to 1600 hours. Thus, each day, 541 signals were sent out to the 28 participants; or each participant received 2.15 signals per hour on the average. Thus, in a typical

8 hour work day, a respondent received 17.14 signals. A daily randomly generated list of respondents to signal was provided to the answering service. The answering service checked each call off as it was made. This list covered 19 days. This list was submitted to a  $X^2$  test to determine if it truly was uniformly distributed. The calculated chi-square value was 31.0 while the critical value with 27 degrees of freedom is 40.1 at the 0.05 level. Thus, the distribution was uniformly distributed.

Having discussed the data collection procedures with the respondents at the first meeting, three tests were administered. These tests provided the data for measuring the three personal variables of interest to this study: leadership orientation, marginality, and need for achievement.

Finally, the respondents were provided some motivation. They were promised the results of their tests as well as the results of how they distributed their time over the study period.

#### Signaling Results

The signals used in the actual study were sent from 1400 hours, 18 August 1982 until 1600 hours, 9 September 1982. The answering service paged each day from 0700 to 1600 hours; however, no respondents actually worked these hours. Respondents worked varying schedules since the ALC uses flex-time. The earliest any respondent

reported to work was 0700 and the latest time a respondent's day finished was 1600 hours. Thus, an assumption had to be made regarding the number of signals sent to each respondent. It was assumed that each respondent could receive signals for only 8 hours of each day. Likewise, some of the respondents from the Directorate of Maintenance terminated their participation on 3 September since they rotated to night shift commencing 7 September. The signaling results are contained in Table 11. In examining the results, one can see that the expected number of signals ranged from 123 to 261 with an average of 229.0 per respondent. The number of signals received ranged from 45 to 213 with an average of 128.9 per respondent. Thus, the response rate ranged from 21.4% to 82.4% with an average of 56.3%. These results were similar to Adcock's results (1977, p. 192). His response rate ranged from 24.0% to 90.4% with a mean of 59.0%. An exact comparison of the two results is not accurate though. In Adcock's study, all individuals participated throughout the study while in this study, they did not. Also, due to varying start and stop times, this study examines the 'expected' number of signals sent as a baseline versus the actual as used by Adcock. In Adcock's study, all respondents had the same lunch period while the respondents in this study did not. Adcock, in further analyzing his response rate, found that he lost signals due to RF shielding and missed

Table 11  
Data Collection Results

Respondent Number	Signals Sent	Signals Received	Expected Percent Received	Number of Errors	Error Rate
1	243	161	66.3	41	25.5
2	210	103	49.0	5	4.9
3	210	173	82.4	1	.6
4	261	135	51.7	2	1.5
5	260	213	81.9	1	.5
6	261	71	27.2	4	5.6
7	261	200	76.6	0	0.0
8	261	88	33.7	1	.8
9	201	92	45.8	4	6.5
10	123	67	54.5	3	4.5
11	260	106	40.8	2	2.9
12	196	106	54.1	4	3.8
13	261	69	26.4	2	2.9
14	124	79	63.7	18	22.8
15	210	131	62.4	9	6.9

Table 11 (con't)

Respondent Number	Signals Sent	Signals Received	Expected Percent Received	Number of Errors	Error Rate
16	244	179	73.4	11	6.1
17	243	117	48.1	2	1.7
18	147	112	76.2	7	6.2
19	260	149	57.3	9	6.0
20	158	125	79.1	20	16.0
21	261	167	64.0	12	7.2
22	260	149	57.3	9	6.0
23	260	166	63.8	9	6.9
24	210	45	21.4	2	4.4
25	261	88	33.7	2	2.3
26	261	179	68.6	3	1.7
27	261	192	73.6	1	0.5
28	244	73	29.9	42	57.5
Summary	6413	3610	56.3	231	6.4

days when respondents were not at work. He added these back in and found his response rate increased to 64.8%. To draw a similar comparison between the two studies, missed observations due to respondent time off and missed signals sent by the answering service (Adcock too had some signals not sent due to operator error.) were added into the results of this study. This brought the response rate up to 66.3% which compared favorably to Adcock's 64.8%.

The error rate ranged from 0% to 57.5 percent with a mean of 6.4% while Adcock's errors ranged from 0% to 30.5% with an average of 12.4%. This would indicate that the steps taken during the initial and follow-on meetings with respondents as well as periodic contacts when errors were noted improved the overall results. However, respondent 28 had an error rate of 57.5%. With an error rate this high, the researcher decided to eliminate this respondent's results from the study. Respondent 28's errors were all of a mechanical nature (errors in completing the form) rather than errors in categorizing activities according to the given definitions. Having excluded respondent 28, the overall errors are examined next.

Overall, 50.3% of the errors were of a mechanical error while Adcock's mechanical errors were 42.5% of the total. This enhances the validity of the study. An effort was made in the two meetings with respondents and

through feedback during the study to ensure that they categorized their responses per the definitions provided. This appeared to have occurred. The categorization errors fell into three areas and accounted for 49.7% of the errors. The categorization errors were similar to Adcock's study: review (20.1%), strategy (28.0%), and negotiation (1.6%). Respondents indicated that they were reviewing or developing strategy when alone. This is not the view used in Mintzberg's work. Managers can only be engaged in review or strategy when they are in meetings. The negotiation errors occurred when respondents indicated they were negotiating alone or with a subordinate. Again, this does not fit the use of negotiating as used by Mintzberg.

The results of the data collection procedures used in this study were very similar to Adcock's results. The range and mean of signals received once adjusted were very similar. However, the procedures used in this study improved the error rate.

#### VALIDITY AND RELIABILITY

Validity and reliability are extremely important to any study. Should either be weak, the results also will be weak. Each of these factors will be discussed in turn.

### Validity

Validity is of the utmost importance to any behavior research. The best definition of validity is simply:

"Are we measuring what we think we are measuring?"

(Kerlinger, 1973, p. 457). However, this question can be answered several ways. There are three types of validity: content, criterion-related, and construct (Kerlinger, 1973, p. 457).

According to Kerlinger, content validity centers around measuring the representativeness of an instrument. The determination of content validity is very much judgmental. For example, one may ask experts in a specific area whether or not an instrument measures what the designer believes the instrument measures. If the experts concur, then the designer has established content validity (1973, p. 458-459). The primary instrument used in this research was the Management Activity Form which was developed by Adcock (1977). Adcock established the content validity of the instrument in his work (p. 202-203). Adcock argued that since the categories and definitions used in the form were selected by an expert, Mintzberg, content validity was established.

The second major type of validity is criterion-related. Kerlinger (1973) stated that this validity ". . . is studied by comparing test or scale scores with one or more external variables, or criteria, known or



believed to measure the attribute under study" (p. 459). In this type of validity one is concerned with the ability of a criterion to predict behavior. This type of validity is not applicable to this study.

The final type of validity, construct, is applicable. Helmstadter stated that one can establish construct validity using correlations or internal consistency (1970, p. 313-317). Correlational evidence of construct validity exists when two measures of the same trait correlate highly. To establish construct validity the results of this study on the percentage of time in the with whom categories, instrumental activities, and verbal contact categories were compared to other studies. To the extent that they correlated, construct validity was established.

The 'With Whom' category of responses are examined first. Table 12 contains the results of this study as well as the results from other studies that have examined the percentage of time managers spend with others. The percentages are very similar across all studies.

Across the subordinate subcategory, the results are very similar. Mintzberg's results are high; however, since Mintzberg dealt with CEOs almost all of their contacts had to be with subordinates.

The results for this study are lower than any others on the outsider subcategory. Horne and Lupton studied the work of 66 middle-level managers and found that

Table 12

## Percentage of Time Spent in the With Whom Category

Subcategory	This Research	Adcock	Mintzberg	Stewart	Sayles	Skeaff	Kelly
With Subordinates	26	23	48	26	18/14	20	28
With Outsiders	3	17	51	1	-	5	-
With Bosses	9	6	-	8	9/3	13	13
With Peers	10	8	-	12	7/4	13	20
Alone	33	31	-	34	-	37	33
With Other Employees	10	15	-	-	-	-	-
With Combination	10		-	-	-	-	-

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Note. Not all figures will add to 100 since comparable categories were included. The 15 under Adcock refers to with other employees and combination.

they spent 10 percent of their time with outsiders. In this study, an outsider was defined as anyone outside of one's directorate. Most workers, except for the very top level managers in these two directorates worked with others in their own directorate. A 3 percent level is not unreasonable though. The CEOs in Mintzberg's study would be expected to spend considerable time with outsiders unlike middle and lower level managers in a corporation or an ALC.

In examining the bosses subcategory, this study is very consistent with the others. The peer subcategory also is well within the expected range of the other studies. Hinrichs studied the activities of 232 managers and found they spent 37 percent of their time alone. Combining this with the data for the alone subcategory in Table 12 indicated that the results of this study were valid for the alone subcategory. Overall this comparison supported the validity of this study.

The 'Doing What' or instrumental category provided information on the validity of this study when compared to previous studies of managerial work. The time the managers in this study spent in meetings was comparable to the other studies as shown in Table 13. The same holds for the time the managers spent on the phone, touring, and doing desk work. Overall, the results of time in instru-

Table 13

## Percentage of Time in Instrumental Activities

	This Research	Adcock	Mintzberg	Extensor
Meetings	58	45	89	68/66
Phone	6	11	8	4/6
Touring	6	13	3	-
Desk Work	26	26	-	-
Other	4	5	-	-
	Stewart	MacKenzie	Helmreich	Hinricks
Meetings	50	8	29	27
Phone	6	8	14	6
Touring	6	8	-	-
Desk Work	36	-	-	-
Other	-	-	-	-

Note. Not all figures will add to 100 since only comparable categories were included.

mental activities supported the validity of the data collected during this study.

Some studies have been performed that examined verbal contact categories. A comparison between this study and those would also add construct validity to this study. Table 14 contains the results of this study and others. The results of this study appear to be reasonable in the receiving information category but a little high in the giving information category. The results for Stewart

Table 14  
Percent of Time Spent in Verbal Contact Categories

Category	This Research	Adcock	Mintzberg	Skeaff	Other
Giving Information	25	22	8	11	Stewart-43 ;
Receiving Information	35	35	16	8	Horne and Lupton-42
Requests	18	25	18	-	-
Review	4	1	16	-	-
Strategy	7	6	13	-	-
Personnel Administration	9	9	-	-	Guest-12
Negotiation	1	1	8	-	Penfield-6
Ceremony	1	7	12	-	Stewart-4

and Horne and Lupton group giving and receiving information together. However, the differences are not large. For the ceremony category, the results of this study are on the low side when compared to the others. However, Stewart's 4 percent results are low and thus comparable to this study's results. All other categories are reasonable and add support to the validity of the results of this study.

A final comparison would be to examine the amount of time that was allocated to each role in this study to Adcock's study. Since this comparison directly related to a Research Hypothesis of this study, the comparison is done in Chapter 4.

Efforts were taken to insure construct validity via internal consistency. The first two days of the experiment were conducted as a training period. During the initial meeting of the first day, Mintzberg's role concept and his terminology, as used on the Management Activities Form, were thoroughly explained. Additionally, a few hypothetical cases were used to demonstrate proper form completion. At the end of the second day, another meeting was held. At this meeting, questions were answered, and respondents were asked to present actual situations where they were unsure on how to complete the form. This approach used a positive training approach to insure respondents understood Mintzberg's terminology yet allowed anonymity

and avoided negative respondent reaction to being observed or checked. This procedure combined with rejecting inconsistent responses when the data was reviewed improved the validity of the study.

Overall, the validity of this study is supported. The comparisons in all three categories support the validity of the study. Equally important to validity is the reliability of the data collected.

#### Reliability

Kerlinger defined reliability as ". . . the proportion of 'true' variance to the total obtained variance of the data yielded by a measuring instrument" (1973, p. 446). A simpler way of stating the concept is to say that if, when one measures something over and over, one get the same results one has reliability.

To examine the reliability of this data, a split-half correlation was done on the data set. If, in fact, the data is reliable, one would expect a high correlation between the amount of time the respondents spent in each role during the first and last half of the data collection periods (Helmstadter, 1970, p. 285-286). The results of the reliability test are contained in Table 15.

In examining the results of the split-half reliability test, one must determine what is an acceptable value. There is no universally accepted reliability figure that appears to be generally acceptable in the literature.

Table 15

## Split-half Reliability Results

Role	r	Corrected r
Figurehead	0.417	0.589
Leader	0.750	0.857
Relationship Leader	0.837	0.911
Task Leader	0.694	0.819
Liaison	0.224	0.366
Monitor	0.685	0.813
Disseminator	0.686	0.814
Spokesman	0.531	0.694
Entrepreneur	0.662	0.797
Resource Allocator	0.449	0.620
Disturbance Handler	0.319	0.483
Negotiator	0.154	0.267
Subordinate	0.855	0.922

Adcock had a split-half reliability of 0.342 which he considered poor. His next lowest score was 0.566 which he termed acceptable (1977, p. 214).

In this study, a reliability of 0.267 for the negotiator role is very suspect. The 0.366 for the liaison role is marginally acceptable. All the other values are about 0.5 or higher which was deemed acceptable for this study.



The assumption made in using the split-half reliability measure is that the activities of the managers did not change over the first and last half of the data collection period. To the extent that this assumption is not true, the reliability for the negotiator and liaison roles could be higher than measured. Regardless, the results for these roles must be taken lightly due to the low reliability measure.

#### SUMMARY

Mintzberg presented his Contingency View of Managerial Work and his role concept in 1973. He believed that management theory must be addressed by examining actual managerial behaviors rather than perceptions of such non-observable concepts as planning, organizing, directing, and staffing. He observed five CEOs and developed his theories. Obviously, much more work had to be done before Mintzberg's views could be generalized.

Adcock's methodology to efficiently examine managerial behavior and test Mintzberg's propositions on management was used in this study. This methodology provided a Management Activities Form and specific mapping rules to map form entries to one of 11 roles. It is this methodology that has allowed the examination of Mintzberg's View and role concept to proceed. To examine these, certain statistical hypotheses were developed for this study.

Three hypotheses directly examining the role concept were developed. Mintzberg (1973) believed that all managers act in all roles though at different levels. This supposition was tested by examining whether or not the responses by role were uniformly distributed. Of course, Mintzberg also argued that all 10 of his roles exist. This statement was examined by testing the role used least frequently to determine if the time in that role was significantly different than zero. The final role hypothesis examined whether or not the subordinate role existed by determining if the time in that role was significantly different than zero. As discussed in the literature review, management theories over the years have stipulated that organization and person variables affect behavior in organizations.

A series of hypotheses were developed to test some of the existing theory. Both a univariate and a multivariate analysis was conducted. The univariate analysis was the least rigorous. It was used to examine the effects of certain organization, person, and combined variable effects. The data was partitioned into subgroups based on particular variables. The subgroups' results were then examined to see if the theory was supported. This test only allowed one variable at a time to vary. Multivariate regression analysis was also used and is a more rigorous test. Two sets of 11 regressions were run. The first

set of 11 included only the organization variables while the second included the organization and person variables. In each regression, all variables varied and thus examined intra-role variation.

In both the analyses, univariate and multivariate, specific relationships were examined. It was hypothesized that those in the upper hierarchy would spend more time in the figurehead role while those at the lowest level would spend more time in the disturbance handler and negotiator roles. Regarding the functional areas, it was expected that line managers would spend more time in the disturbance handler and in the informational roles. Prior theory supported the hypothesis that as the span of control increases, time in the leader, disseminator, resource allocator, and disturbance handler roles would increase. Finally, as the size of the unit supervised increased, one would expect time in the disturbance handler, disseminator, leader, and resource allocator roles to increase.

From the person variable perspective, certain hypotheses were developed. One can expect marginal managers to spend more time in the monitor role than non-marginal managers. Task-oriented managers should spend more time in the task leader and disseminator roles while relationship-oriented managers should spend more time in the relationship leader role. Finally, managers with high n Ach should

have spent more time in the entrepreneur and negotiator roles. As stated in this chapter, certain combined effects probably existed as ascertained from theory. Thus, three hypotheses were developed to examine these effects. One can reasonably expect marginal, first line supervisors to spend more time in the monitor, resource allocator, and disturbance handler roles. Likewise, mid-level managers with high n Ach should spend more time in the entrepreneur and negotiator roles. The final hypothesis examined dealt with public versus private managers.

This study sampled the activities of public managers in an Air Force Air Logistics Center which is a large industrial organization. Regarding management in public and private organizations, the theory is very contradictory. Some believe that the management is different in these two types of organizations, and others believe that the management is basically the same with only minor differences. To test this theory, the results of this study were compared to a previous comparable study of managers in a private organization.

Finally, validity and reliability were addressed. The construct validity of this study was well supported by comparing the data collected to that of previous studies examining the time managers spent with others, in instrumental activities, and in verbal contact categories. Reliability was addressed using a split-half reliability test.

The reliability for the negotiator role was suspect while that for the liaison role was marginally acceptable.

All others were acceptable and ranged from nearly 0.5 to more than 0.9. Having established the theoretical basis for this study and developed the methodology, the data was collected. The next chapter presents the results of the data analyses.

## CHAPTER 4

### DATA ANALYSES

This chapter is divided into six sections. The first section presents the statistical results relating to the roles and thus addresses Research Hypothesis 1a. Next, the effect of the organization variables on how the managers distributed their time is examined. This section specifically addresses Research Hypothesis 1b. The third section of this chapter reports on the results regarding the effects of person variables and thus addresses Research Hypothesis 3. Combined effects are addressed next and relate to Research Objective 3. The final statistical hypothesis addresses the difference between private and public managers in their time distribution among the roles which addresses Research Hypothesis 2. The final section is the summary of the analyses of this data and Adcock's data.

The Hypotheses are restated below:

1a. Military/government managers do act in all 11 roles though at different levels due to the effect of certain variables.

1b. Organization variables affect how managers distribute their time among roles.

(1) Hierarchical level will affect time in the figurehead, disturbance handler, and negotiator roles.

(2) Span of control will affect time in the leader, disseminator, resource allocator, and disturbance handler roles.

(3) Line versus staff will affect time in the disturbance handler, negotiator, monitor, disseminator, and spokesman roles.

(4) Size of unit supervised will affect time in the disseminator, disturbance handler, and leader roles.

2. Private managers (using Adcock's sample) will distribute their time among the roles differently than military/government managers.

3. Person variables will affect how managers distribute their time among roles.

a. Leadership orientation will affect time in the disseminator and leader roles.

b. Need for achievement will affect time in the entrepreneur and negotiator roles.

c. Marginality will affect time in the monitor, disturbance handler, and resource allocator roles.

The above Research Hypotheses correspond to the Research Objectives in Chapter 1 (designated with arabic numerals). The statistical hypotheses (designated with roman numerals) correspond to specific Research Hypotheses (designated with arabic numerals). The

results of the data analyses are presented in the same order as the methodology was presented in Chapter 3.

## ROLES

Research Hypothesis 1a stated that managers act in all 11 roles but do not distribute their time equally among the roles. This particular Research Hypothesis supported Research Objective 1a dealing with time in roles. Several statistical hypotheses were tested in support of Research Hypothesis 1a.

### Role Uniformity

Null I: The sampling distribution of the managers' responses as a group is uniform among the roles, i.e., the sample was drawn from a multifold population with a uniform probability distribution.

Alternate I: The sampling distribution of the managers' responses, as a group, is nonuniform among the roles, i.e., the sample was drawn from a multifold population with a nonuniform probability distribution. (Adcock, 1977, p. 132)

Table 16 contains the number of responses from each subject. The chi-square observed ( $X^2_0$ ) value for the sample was 4757.06. The critical chi-square value with 10 degrees of freedom at the 0.05 level of significance ( $X^2_{C,10,.05}$ ) is 18.3. Therefore, the distribution was nonuniform and the null hypothesis was rejected. Thus, the managers did distribute their time unequally among roles as hypothesized by Mintzberg.



Table 16  
Chi-square Calculation for Hypothesis I

	F <sub>j</sub> Observed	F <sub>j</sub> Expected	Contribution to Chi-square	Relative F <sub>j</sub>
Figurehead	35.0	304.18	238.21	.01
Leader	444.5	304.18	64.73	.13
Liaison	14.0	304.18	276.82	.00
Monitor	1304.5	304.18	3289.63	.39
Disseminator	383.0	304.18	20.42	.11
Spokesman	589.0	304.18	266.69	.18
Entrepreneur	134.5	304.18	94.65	.04
Resource Allocator	134.0	304.18	95.21	.04
Disturbance Handler	63.0	304.18	191.23	.02
Negotiator	139.0	304.18	89.70	.04
Subordinate	105.5	304.18	129.77	.03
	3346.0	3346.00	4757.06	1.00

### The Subordinate Role

Though Mintzberg (1973) found ten roles, Adcock (1977) offered an eleventh: the subordinate role.

Research Hypothesis 1a hypothesized that all eleven roles exist and was derived from Research Objective 1a concerning the existence of a subordinate role. Statistical hypothesis V addressed this issue.

Null V: All the managerial activities and interactions measured can be assigned to one of the existing roles, i.e., no new roles will be discovered.

Alternate V: A significant number of the observations of managers' activities and interactions as a group will not be assignable to one of the existing roles, i.e., the subordinate ( $p_{11}$ ) role will be nonzero. (Adcock, 1977, p. 139)<sup>1</sup>

The null was rejected and it was concluded that the subordinate role did exist. The confidence interval was  $0.026 \leq p_{11} \leq 0.037$ . This supported Adcock's (1977) position.

### Existence of All Roles

This statistical hypothesis also was derived from Research Hypothesis 1a and Research Objective 1a in examining whether all eleven roles existed in this study. If Mintzberg (1973) was correct, all roles should have existed.

Null VII: The proportion of responses by the group as a whole among the roles will be zero for one or more roles.

Alternate VII: All the roles will be greater than zero, i.e., there will be no single role in which the group as a whole has no response.

This hypothesis was tested in the same manner as Hypothesis V and as outlined in Chapter 3. In this study, the liaison role had the fewest observations of all eleven roles. Building a 95% confidence interval around this role with an  $R = 14$  yielded

$$0.002 - p_3 - 0.006$$

Thus, the null was rejected in this study. Mintzberg (1973) was correct.

#### ORGANIZATION VARIABLES

The following statistical hypotheses provided the results needed to answer Research Hypotheses 1b(1) through 1b(4) derived from Research Objective 1b. Each examined a different aspect of the effect of organization variables on how managers distributed their time among the roles.

##### Hierarchical Level

Hierarchical level is one of the most studied organization variables in management literature. As a manager proceeds up the hierarchical ladder, one expects the manager to spend more time in figurehead activities. Likewise, lower level managers face day-to-day operational problems and thus should spend more time in disturbance handler and negotiation activities than upper level managers.

The following statistical hypothesis was derived from Research Hypothesis 1b(1) and Research Objective 1b.

Hypothesis II dealt with differences in managerial time distribution due to one's hierarchical level in the organization. Table 17 presents the number of observations among roles distributed by hierarchical level.

Null II: There is no significant difference in the response distribution among the roles by the group of managers characterized as level 1 (highest level) and the group characterized as level 3 (lowest level)

Alternate II-1: A significant difference exists between the responses of the level 1 managers as a group, and the responses of the level 3 managers as a group, insofar as the figurehead ( $p_1$ ) role.

Alternate II-2: A significant difference exists between the responses of the level 1 managers as a group and the level 3 managers insofar as the combination of the disturbance handler ( $p_9$ ) and the negotiator ( $p_{10}$ ) roles. (Adcock, 1977, p. 133-135)

The chi-square value was calculated for Alternate II-1 and the  $X^2_{\text{O}}$  value was 47.51. Since the  $X^2_{\text{C},2,.05}$  is 5.99, the null hypothesis was rejected in the expected direction. Thus, managers at different levels in the organization do distribute their time differently regarding the figurehead role. The theory was thus supported as it was in other research (Adcock, 1977, p. 228). This too was discovered by Alexander (1979) and Pavett and Lau (1983) when they examined the perceptions of managers.

Alternate II-2 was analyzed next using the chi-square test. The  $X^2_{\text{O}}$  value was 3.69 while the  $X^2_{\text{C},2,.05}$  is 5.99. Thus, the null was not rejected and it appeared

Table 17

## Responses by Hierarchical Level for Hypothesis II

Respondent Number	Figurehead	Disturbance Handler	Negotiator	Total Responses
Level 1				
10	0	0	2	64
12	2	6	7	102
20	<u>12</u>	<u>0</u>	<u>0</u>	<u>105</u>
Totals	14	6	9	271
Level 2				
11	3	2	0	103
13	0	0	2	67
15	0	3	3	122
18	2	1	0	105
21	2	5	4	155
23	4	2	3	147
26	<u>2</u>	<u>11</u>	<u>5</u>	<u>176</u>
Totals	13	24	17	875
Level 3				
1	0	1	2	120
2	1	3	4	98
3	0	0	0	172
4	3	5	0	133
5	0	14	16	212
6	0	0	2	67
7	0	0	1	200
8	1	0	13	126
9	0	0	9	86
14	0	0	0	61
16	1	1	11	168
17	1	1	4	115
19	1	3	8	140
22	0	1	12	182
24	0	1	0	43
25	0	3	5	86
27	<u>0</u>	<u>0</u>	<u>24</u>	<u>191</u>
Totals	8	33	113	2200

Note. On this table and all others presenting data in this manner, total responses represent the total number of responses by a respondent over the entire study.

that managerial time was not distributed differently in the disturbance handler and negotiator roles depending on a manager's hierarchical level in an organization. Adcock rejected the null but found that higher level managers spent more time in these roles than did lower level managers - the opposite of what theory predicts (Pavett and Lau, 1983, p. 173; Mintzberg, 1973, p. 130). Though this null could not be rejected, the lower level managers did spend more time in the disturbance handler and negotiator roles. However, Vorwerk (1979) in measuring the perceptions of managers found no difference regarding negotiator activities. Alexander's (1979) results found no support for hierarchical level differences in the perceptions of the disturbance handler role.

#### Line versus Staff

Research Hypothesis 1b(3) was derived from Research Objective 1b and stated that the functional area, line versus staff, would affect the time a manager spent in the disturbance handler, negotiator, monitor, disseminator, and spokesman roles. Hypothesis III examined the distribution of managerial time of both line and staff managers. Table 18 presents the number of observations among roles distributed by line/staff.

Null III: There is no significant difference in the response distribution among the roles by the group of managers characterized as line and the group characterized as staff.

Table 18  
Responses by Line/Staff for Hypothesis III

Respondent Number	Disturbance Handler	Negotiator	Monitor	Disseminator	Spokesman	Total Responses
Line						
3	0	0	66	59	45	172
4	5	0	79	18	16	133
5	14	16	62	15	45	212
9	0	9	33	18	21	86
15	3	3	48.5	16.5	25.5	122
17	1	4	10	44	25	115
19	3	8	47	5	42	140
20	0	0	84	4	4	105
21	5	4	44	16	19	155
22	1	12	79	33	28	182
24	1	0	7	13	5	43
26	11	5	72.5	13	24.5	176
Totals	44	61	632	254.5	300	1641

Table 18 (con't)

Respondent Number	Disturbance Handler	Negotiator	Monitor	Disseminator	Spokesman	Total Responses
Staff						
1	1	2	45	18	32	120
2	3	4	36	5	10	98
6	0	2	24	11	26	67
7	0	1	147.5	17	30.5	200
8	0	13	32	13	20	126
10	0	2	16.5	8	11.5	64
11	2	0	21	16	4	103
12	6	7	48.5	4.5	3	102
13	0	2	17.5	2	11.5	67
14	0	2	12	0	22	61
16	1	11	46.5	18	27.5	168
18	1	0	51	10	17	105
23	2	3	50	6	13	147
25	3	5	52	0	18	86
27	0	24	73	0	43	191
Totals	19	78	672.5	128.5	289	1705



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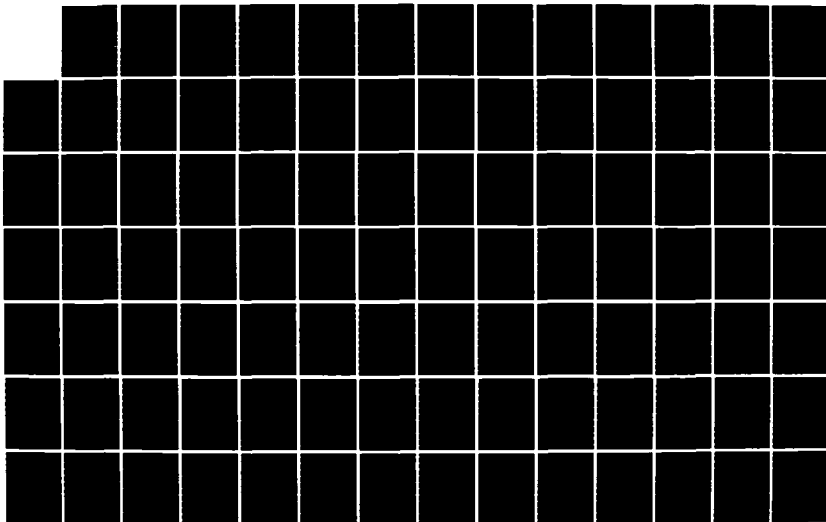
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WRIGHT-PATTERSON AFB OH A L RASTETTER III DEC 85  
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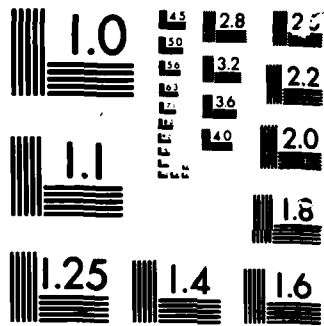
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Alternate III-1: A significant difference exists between the response distribution of line managers and staff managers insofar as the combination of the disturbance handler ( $p_9$ ) and negotiator ( $p_{10}$ ) roles.

Alternate III-2: A significant difference exists between the response distribution of line managers and staff managers insofar as the combination of the informational roles, monitor ( $p_4$ ), disseminator ( $p_5$ ), and spokesman ( $p_6$ ) roles. (Adcock, 1977, p. 137)

The chi-square values were calculated for each of the above alternate hypotheses. The results for Alternate III-1 yielded a  $X^2_0$  of 0.6 while the  $X^2_{c,1,.05}$  is 3.84. Thus, the null was not rejected. The results did indicate, though, that the line managers spent more time in these roles than did the staff managers. This was different than Adcock found but in the direction expected by theory (Mintzberg, 1973, p. 130; Alexander, 1979, p. 67-72). Adcock rejected the null but in the opposite direction than expected, i.e., he found the staff managers spent more time in these roles than the line managers (1977, p. 234).

The observed chi-square value for Alternate III-2 was 8.55; and, therefore, the null was rejected. However, the null was rejected in the opposite direction than expected. In fact, it was found that the line spent more time in these informational roles than the staff. Adcock too rejected the null but in the expected direction (1977, p. 234).

### Span of Control

Research Hypothesis 1b(2) stated that span of control affects time in the leader, disseminator, resource allocator, and disturbance handler roles. The next statistical hypothesis tested if span of control affected time in these roles. The data for this analysis is presented in Table 19.

Null IV: There is no significant difference between the group of managers whose span of control is 3 or less and the group of managers whose span of control is greater than 3, insofar as the distribution of their responses to the combination of leader ( $p_2$ ), disseminator ( $p_5$ ), resource allocator ( $p_8$ ), and disturbance handler ( $p_9$ ) roles.

Alternate IV: A significant difference exists between the group of managers whose span is 3 or less and the group of managers whose span is greater than 3, insofar as the distribution of their responses to the combination of leader ( $p_2$ ), disseminator ( $p_5$ ), resource allocator ( $p_8$ ), and disturbance handler ( $p_9$ ) roles. (Adcock, 1977, p. 138-139)

The  $X^2_0$  for the test was 51.32. Since the  $X^2_{c,1,.05}$  is 3.84, the null was rejected. Thus, managers with larger spans of control did spend more time in these roles. Adcock's results were the same (1977, p. 237).

### Multivariate Analyses

The previous statistical hypotheses examined the effects of the organization variables on times in roles using a univariate analysis yielding an inter-role perspective. A more powerful test was used. Specifically a regression analysis was performed for each role to

Table 19  
Responses by Span of Control for Hypothesis IV

Respondent Number	Leader	Disseminator	Resource Allocator	Disturbance Handler	Total Responses
Span $\leq$ 3					
7	1	17	2	0	200
13	15	2	3	0	67
23	61	6	3	2	147
25	1	0	0	3	86
27	5	0	2	0	191
Totals	78.5	25	10	5	691

Table 19 (con't)

Respondent Number	Leader	Disseminator	Resource Allocator	Disturbance Handler	Total Responses
Span > 3					
1	6	18	1	1	120
2	20	5	8	3	98
3	0	59	2	0	172
4	12	18	0	5	133
5	40	15	16	14	212
6	4	11	0	0	67
8	24.5	13	12	0	126
9	2	18	1	0	86
10	13.5	8	1	0	64
11	34	16	16	2	103
12	7	4.5	10	6	102
14	17	0	2	0	61
15	17.5	16.5	5	3	122
16	32	18	11	1	168
17	5	44	5	1	115
18	10	10	6	1	105
19	20	5	6	3	140
20	0	4	0	0	105
21	36	16	8	5	155
22	23	33	3	1	182
24	16	13	0	1	43
26	26.5	13	11	11	176
Totals	366	358	124	58	2655

examine intra-role variability. The following statistical hypothesis was tested:

Null VI: The relationship

$$P_{ij} = B_0 + B_1X_1 + B_2X_2 + B_3X_3 + B_4X_4 + B_5X_5 + B_6X_6 + e$$

where,

$P_{ij}$  = estimate of time spent in  $i^{\text{th}}$  role by respondent  $j$

$B_0$  to  $B_6$  = regression coefficients

$X_1$  = 1 if the respondent was assigned to organization level 2; 0 otherwise

$X_2$  = 1 if the respondent was assigned to organization level 1; 0 otherwise

$X_3$  = 1 if the respondent is on staff

$X_4$  = 1 if the respondent has a span equal to 1 (3 - 6); 0 otherwise

$X_5$  = 1 if the respondent had a span equal to 2 ( $\geq 7$ ); 0 otherwise

$X_6$  = total number of employees reporting to the respondent

$e$  = error

will not be significant in explaining the intra-role variability for any one of the eleven roles. (Adcock, 1977, p. 140)

The alternate hypotheses associated with this null were tested using data provided in Table 20 and 21. The results of each regression analysis follow. The overall regression was considered significant if the F-statistic was  $\leq 25$  percent. Once a regression was deemed significant, the individual t-statistics were examined. T-statistics were considered significant if they were  $\leq 5$  percent.

Table 20

## Respondents' Time Distribution by Role

Respondent Number	Figurehead	Leader	Liaison	Monitor	Disseminator	Spokesman	Entrepreneur	Resource Allocator	Disturbance Handler	Negotiator	Subordinate
1	0.0	0.05	0.0	0.375	0.15	0.2667	0.1	0.0083	0.0083	0.0167	0.025
2	0.0102	0.2041	0.0	0.3673	0.051	0.102	0.0816	0.0816	0.0306	0.0408	0.0306
3	0.0	0.0	0.0	0.3837	0.343	0.2616	0.0	0.0116	0.0	0.0	0.0
4	0.0226	0.0902	0.0	0.594	0.1353	0.1203	0.0	0.0	0.0376	0.0	0.0
5	0.0	0.1887	0.0094	0.2925	0.0708	0.2123	0.0	0.0755	0.066	0.0755	0.0094
6	0.0	0.0597	0.0	0.3582	0.1642	0.3881	0.0	0.0	0.0	0.0299	0.0
7	0.0	0.005	0.0	0.7375	0.085	0.1525	0.0	0.01	0.0	0.005	0.005
8	0.0079	0.1944	0.0	0.254	0.1032	0.1587	0.0516	0.0952	0.0	0.1032	0.0317
9	0.0	0.0233	0.0	0.3837	0.2033	0.2442	0.0	0.0116	0.0	0.1047	0.0233
10	0.0	0.2109	0.0	0.2578	0.125	0.1797	0.1641	0.0156	0.0	0.0313	0.0156
11	0.0291	0.3301	0.0	0.2039	0.1553	0.0388	0.0388	0.1553	0.0194	0.0	0.0291
12	0.0196	0.0686	0.0	0.4755	0.0441	0.0294	0.1176	0.098	0.0588	0.0686	0.0196
13	0.0	0.2239	0.0	0.2612	0.0299	0.1716	0.2388	0.0448	0.0	0.0299	0.0
14	0.0	0.2787	0.0328	0.1967	0.0	0.3607	0.0656	0.0328	0.0	0.0328	0.0
15	0.0	0.1434	0.0	0.3975	0.1352	0.209	0.0164	0.041	0.0246	0.0246	0.0082
16	0.006	0.1905	0.0	0.2768	0.1071	0.1637	0.1012	0.0655	0.006	0.0655	0.0179
17	0.0087	0.1435	0.0087	0.087	0.3826	0.2174	0.0174	0.0435	0.0087	0.0348	0.1478
18	0.019	0.0952	0.0	0.4857	0.0952	0.1619	0.0667	0.0571	0.0095	0.0	0.0095
19	0.0071	0.1429	0.0286	0.3357	0.0357	0.3	0.0214	0.0429	0.0214	0.0571	0.0071
20	0.1143	0.0	0.0	0.8	0.0381	0.0381	0.0095	0.0	0.0	0.0	0.0
21	0.0129	0.2323	0.0129	0.2839	0.1032	0.1226	0.0903	0.0516	0.0323	0.0258	0.0323
22	0.0	0.1264	0.0	0.4341	0.1813	0.1538	0.0	0.0165	0.0055	0.0459	0.0165
23	0.0272	0.415	0.0	0.3401	0.0408	0.0884	0.034	0.0204	0.0136	0.0204	0.0
24	0.0	0.3721	0.0233	0.1628	0.3023	0.1163	0.0	0.0	0.0233	0.0	0.0
25	0.0	0.0116	0.0116	0.6047	0.0	0.2093	0.0116	0.0	0.0349	0.0581	0.0581
26	0.0114	0.1506	0.0	0.4119	0.0739	0.1392	0.0455	0.0625	0.0625	0.0284	0.0142
27	0.0	0.0026	0.0052	0.3822	0.0	0.2251	0.0079	0.0105	0.0	0.1257	0.2408



Table 21  
Organizational Variables by Respondent

Respondent Number	Line or Staff	Hierarchical Level <sup>*</sup>	Span of Control <sup>#</sup>	Number of Subordinates
1	S	3	6	7
2	S	3	27	27
3	L	3	14	14
4	L	3	18	18
5	L	3	13	13
6	S	3	13	13
7	S	3	0	0
8	S	3	10	10
9	L	3	12	12
10	S	1	5	195
11	S	2	15	45
12	S	1	9	285
13	S	2	3	30

\* 1 is the highest and 3 is the lowest hierarchical level

#For the regression analyses, span of control was divided into three categories:  
0 - 2, 3 - 6,  $\geq 7$

Table 21 (con't)

Respondent Number	Line or Staff	Hierarchical Level *	Span of Control #	Number of Subordinates
14	S	3	15	15
15	L	2	15	197
16	S	3	12	12
17	L	3	10	107
18	S	2	5	33
19	L	3	26	197
20	L	1	10	6780
21	L	2	12	165
22	L	3	17	17
23	S	2	3	18
24	L	3	13	13
25	S	3	0	0
26	L	2	5	100
27	S	3	0	0

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\* 1 is the highest and 3 is the lowest hierarchical level

# For the regression analyses, span of control was divided into three categories:  
0 - 2, 3 - 6,  $\geq 7$

Prior to presenting the results of these regressions, it is necessary to discuss data scales and the assumptions of multiple linear regression. First, to use regression analysis one must have interval data. The data collected in the research were not interval. Each time an individual was signaled, he completed a Management Activities Form. This response was then mapped to a particular role. Since frequencies of observations were taken, those observations were basically ordinal. However, since for any role and respondent, the ratio of observations in that role to the total provided an estimate of the time a respondent spent in the role, one can argue that interval criteria were met. Thus, regression analysis could be a valid statistical method. Likewise, since for each respondent the time in a role was an estimate of the true time in a role and since there were 27 respondents, the central limit theorem implies that the sampling distribution was normal.

Besides the requirement for interval data, one must assume independence of, a constant variance for, and normal distribution of the error terms. If these assumptions were not met, three specific problems could arise: multicollinearity, heteroscedasticity, and autocorrelation. Multicollinearity exists when two or more variables are highly correlated with each other. Multicollinearity causes high standard errors for regression parameters.

Thus, the effect is to cause significant variables not to be significant (Pindyck and Rubinfeld, 1976, p. 66-68). In this study, no attempt was made to correct for multicollinearity. Instead, its existence was accepted and considered in the interpretation of the results. Table 22 presents the correlation coefficients for the organization variables. Two correlations deserve comment. There was a relatively high correlation between line/staff and span of control. It appeared that the staff managers generally possessed a larger span of control in this study. Likewise, the correlation between hierarchical level and the number supervised indicated that the higher the manager was in an organization the more subordinates he had. Again, no corrective action was taken in this study for multicollinearity.

When the error term variance is not constant, heteroscedasticity exists (Neter et al, 1985, p. 170). The effect of heteroscedasticity is just the opposite of multicollinearity. The variances are understated and insignificant variables appear as significant (Pindyck and Rubinfeld, 1976, p. 96). Though it is possible to test for and correct heteroscedasticity, no such action was taken in this study. Adcock found heteroscedasticity in only two of his eleven regressions. The correction for his problem did not eliminate the problem so he

Table 22

## Correlations between Organization Variables

Variable	Line/Staff	Hierarchical Level	Span of Control	Number Supervised
Line/staff	1.00	.08	.47	.23
Hierarchical Level		1.00	.02	-.47
Span of Control			1.00	.14
Number Supervised				1.00

concluded that there was little effect (1977, p. 254-262). Consequently, the same assumption was made in this study.

Autocorrelation exists when the error terms are not independent. The effect of autocorrelation is the same as heteroscedasticity in that variance is understated which causes insignificant relationships to appear significant (Neter et al, 1985, p. 444-445). In this study, the Durbin-Watson statistic was used to test for autocorrelation. A test statistic,  $D$ , was calculated for each regression. If  $D$  was larger than the critical upper limit,  $d_u$ , and less than  $4 - d_l$ , autocorrelation did not exist. If  $D$  was less than the critical lower limit,  $d_l$ , or greater than  $4 - d_l$ , autocorrelation existed. Any other situation was inconclusive (Neter et al, 1985, p. 451-454). To test for autocorrelation a 5 percent significance level was used. A table for six or more

variables could not be found so an interpolation had to be done. The  $d_1$  value used was 0.94 and the  $d_u$  value was 1.96.

Having laid the groundwork for the regression analyses, the results are presented.

Alternate VI-1: The relationship will be significant for the figurehead ( $p_1$ ) role.

Subalternate VI-1.1: In this significant relationship,  $B_2$  will be greater than  $B_1$  and  $B_1$  will be greater than the baseline. (Adcock, 1977, p. 140)

The statistical results for each of the regression analyses associated with Hypothesis VI are included in Table 23. The relationship was significant at the 0.1% level for the figurehead role and the null was rejected. The adjusted  $R^2$  value was 0.858. The relationship was

$$p_1 = -0.00541 + 0.01087X_1 + 0.00002X_6$$

All significant regressions are reported as above, i.e., only the constant and significant independent variables will be shown to highlight those particular terms.

The  $B_2$  coefficient was not greater than  $B_1$ ; however,  $B_1$  was greater than the baseline. The Durbin-Watson statistic was 1.64 which placed it in the indeterminate region. It appeared that being at mid-level management and the number of subordinates explained most of the variation. Having worked at an ALC, this researcher was not surprised to see a significant relationship for the number supervised. The more subordinates one has,

Table 23  
Regression Results on Organizational Variables

Role	F	R <sup>2</sup> <sub>adj</sub>	B <sub>0</sub>	B <sub>1</sub> t <sub>1</sub>	B <sub>2</sub> t <sub>2</sub>	B <sub>3</sub> t <sub>3</sub>	B <sub>4</sub> t <sub>4</sub>	B <sub>5</sub> t <sub>5</sub>	B <sub>6</sub> t <sub>6</sub>
Figurehead	27.10 <sup>b</sup>	0.858	-0.00541	0.01087 2.339 <sup>e</sup>	0.00290 0.179	0.00541 1.353	0.00200 0.282	0.00738 1.244	0.00002 9.461 <sup>a</sup>
Disturbance Handler	1.18	0.041	0.02856	0.01472 1.350	0.02882 1.701	-0.01692 -1.805 <sup>f</sup>	-0.01294 -0.778	-0.00572 -0.410	-0.00001 -1.873 <sup>f</sup>
Negotiator	1.00	0.001	0.06027	-0.01885 -0.984	0.01151 0.386	0.00266 0.161	-0.03020 -1.034	-0.01523 -0.625	-0.00001 -1.160
Monitor	3.52 <sup>e</sup>	0.368	0.61642	-0.00173 -0.024	0.03642 0.330	-0.04162 -0.682	-0.23540 -2.175 <sup>e</sup>	-0.28256 -3.115 <sup>c</sup>	0.00006 2.392 <sup>e</sup>
Disseminator	2.06 <sup>h</sup>	0.197	0.11363	-0.05785 -1.192	-0.02198 -0.291	-0.08530 -2.044 <sup>f</sup>	0.08680 1.173	0.08306 1.339	-0.00002 -1.145
Spokesman	1.93 <sup>h</sup>	0.176	0.19684	-0.10998 -2.492 <sup>e</sup>	-0.13573 -1.979 <sup>f</sup>	-0.00121 -0.0319	0.06838 1.016	0.01935 0.343	-0.00001 -0.342
Leader	2.36 <sup>g</sup>	0.238	-0.05910	0.03940 1.733 <sup>f</sup>	-0.01520 -0.175	0.06550 1.367	0.13270 1.562	0.17488 2.456 <sup>e</sup>	-0.00002 -0.738
Resource Allocator	3.65 <sup>e</sup>	0.379	-0.02730	0.05059 3.072 <sup>c</sup>	0.02795 1.092	0.03413 2.410 <sup>e</sup>	-0.00426 -0.170	0.05156 2.451 <sup>e</sup>	-0.00001 -1.248
Liaison	0.55	0.141 <sup>u</sup>	0.00027	-0.00332 -0.616	-0.00444 -0.530	-0.00267 -0.576	-0.00306 -0.372	0.00049 0.071	-0.00000 -0.280

<sup>a</sup>Significance  $\leq 0.05\%$

<sup>b</sup>0.05% < Significance  $\leq 0.1\%$

<sup>c</sup>0.1% < Significance  $\leq 0.5\%$

<sup>d</sup>0.5% < Significance  $\leq 1.0\%$

<sup>e</sup>1.0% < Significance  $\leq 2.5\%$

<sup>f</sup>2.5% < Significance  $\leq 5.0\%$

<sup>g</sup>5.0% < Significance  $\leq 10.0\%$

<sup>h</sup>10.0% < Significance  $\leq 25.0\%$

<sup>u</sup>Unadjusted R<sup>2</sup> value

Table 23 (con't)

Role	F	P <sup>2</sup> <sub>adj</sub>	P <sub>0</sub>	B <sub>1</sub> t <sub>1</sub>	B <sub>2</sub> t <sub>2</sub>	B <sub>3</sub> t <sub>3</sub>	B <sub>4</sub> t <sub>4</sub>	B <sub>5</sub> t <sub>5</sub>	B <sub>6</sub> t <sub>6</sub>
Entrepreneur	4.76 <sup>c</sup>	0.465	-0.04001	0.02042 0.873	0.06899 1.897 <sup>f</sup>	0.04651 2.311 <sup>e</sup>	0.08496 2.382 <sup>e</sup>	0.04920 1.646	-0.00001 -1.142
Subordinate	1.30	0.064	0.10786	-0.00436 -0.160	0.00226 0.053	-0.00656 -0.0280	-0.08890 -2.140 <sup>e</sup>	-0.08236 -2.365 <sup>e</sup>	-0.00000 -0.387

<sup>a</sup>Significance  $\leq 0.05\%$ <sup>b</sup>0.05% < Significance  $\leq 0.1\%$ <sup>c</sup>0.1% < Significance  $\leq 0.5\%$ <sup>d</sup>0.5% < Significance  $\leq 1.0\%$ <sup>e</sup>1.0% < Significance  $\leq 2.5\%$ <sup>f</sup>2.5% < Significance  $\leq 5.0\%$ 95.0% < Significance  $\leq 10.0\%$ 10.0% < Significance  $\leq 25.0\%$ <sup>u</sup>Unadjusted R<sup>2</sup> value



the more time one spends dispensing rewards such as certificates of appreciation. Adcock too rejected the null with an overall significance level of 5 percent with and adjusted  $R^2$  of 0.359 and the following relationship

$$p_1 = 0.00006 + 0.01750X_2$$

Adcock found that managers at the highest level of management allocated more time to this role (1977, p. 253). This result is not terribly surprising. This study included more than mid-level managers which is what Adcock sampled. Thus, his upper-level managers may have been more equivalent to this study's middle-level managers.

Alternate VI-2: The relationship will be significant for the disturbance handler ( $p_9$ ) role.

Subalternate VI-2.1: In this significant relationship,  $B_2$  will be less than  $B_1$  and  $B_1$  will be less than the baseline.

Subalternate VI-2.2: In this significant relationship,  $B_5$  will be greater than  $B_4$  and  $B_4$  will be greater than the baseline.

Subalternate VI-2.3: In this significant relationship,  $B_6$  will be greater than zero.

The overall relationship for the disturbance handler role was not significant. Adcock did find a significant relationship at the 2.5 percent level with an adjusted  $R^2$  of 0.437 (1977, p. 253). The relationship was

$$p_9 = 0.00383 + 0.00008X_6$$

As predicted, Adcock found that those with the largest number of subordinates spent more time in this role.

Alternate VI-3: The relationship will be significant for the negotiator ( $p_{10}$ ) role.

Subalternate VI-3.1: In this significant relationship, the absolute value of  $B_1$  will be significantly different from the baseline but the coefficient will be negative and the absolute value of  $B_2$  will be greater than  $B_1$  but the sign of  $B_2$  will be negative. Also, the coefficient of  $B_3$  will be significant and negative.

The overall results for this regression were insignificant as were Adcock's overall results (1977, p. 253).

Alternate VI-4: The relationship will be significant for the monitor ( $p_4$ ) role.

Subalternate VI-4.1: In this significant relationship, the coefficient  $B_3$  will be greater than zero.

The overall relationship was found to be significant at the 2.5% level with an adjusted  $R^2$  of 0.368 for this role contrary to Adcock's findings which were insignificant (1977, p. 235). The Durbin-Watson statistic was 2.41; therefore, the results for autocorrelation were indeterminate. Thus, the null hypothesis was rejected. The significant relationship is shown as

$$p_4 = 0.61642 - 0.23540X_4 - 0.28256X_5 + 0.00006X_6$$

In this study,  $B_3$  was not significantly greater than zero. The significant t-values were associated with span of control and the number of subordinates. The results indicated that the larger the span of control the less time a manager spent in the monitor role. Interestingly, though, the more subordinates an individual had, the more time he spent in this role.

Alternate VI-5: The relationship will be significant for the disseminator ( $p_5$ ) role.

Subalternate VI-5.1: In this significant relationship, the coefficient  $B_3$  will be greater than zero.

Subalternate VI-5.2: In this significant relationship, the coefficient  $B_5$  will be greater than  $B_4$  and  $B_4$  will be greater than the baseline.

Subalternate VI-5.3: In this significant relationship, the coefficient  $B_6$  will be greater than zero.

The overall relationship for this regression was significant at the 25 percent level while Adcock's results were insignificant (1977, p. 253). The adjusted  $R^2$  was 0.197 and the relationship was

$$p_5 = 0.11363 - 0.08530X_3$$

In this study,  $B_3$  was significant but less than zero rather than greater than zero. Thus, line managers spent more time in the disseminator role. Neither  $B_4$  nor  $B_5$  was significant. The Durbin-Watson statistic was 2.31 so the result was indeterminate.

Alternate VI-6: The relationship will be significant for the spokesman ( $p_6$ ) role.

Subalternate VI-6.1: In this significant relationship, the coefficient  $B_3$  will be greater than zero. (Adcock, 1977, p. 142)

This relationship was significant at the 25 percent level with an adjusted  $R^2$  of 0.176 and the following relationship:

$$p_6 = 0.19684 - 0.10998X_1 - 0.13573X_2$$

$B_3$  was not greater than zero as expected. The Durbin-Watson statistic was 1.73 which placed in in the indeterminate region. The results indicated that those at lower levels of management spent more time in this role

than higher level managers. Adcock too had significant overall results at the 25% level; however, none of his t-tests were significant (1977, p. 253).

Alternate VI-7: The relationship will be significant for the leader ( $p_2$ ) role.

Subalternate VI-7.1: In this significant relationship, the coefficient  $B_5$  will be greater than  $B_4$  and  $B_4$  will be greater than the baseline.

Subalternate VI-7.2: In this significant relationship, the coefficient  $B_6$  will be greater than zero.

The overall results were significant at the 10% level with an adjusted  $R^2$  of 0.238 although Adcock's results were not significant. The Durbin-Watson statistic was 1.86 which placed in in the indeterminate region. Subalternate VI-7.1 was supported, but Subalternate VI-7.2 was not supported. The relationship was

$$p_2 = -0.05910 + 0.09940X_1 + 0.17488X_5$$

Thus, it appeared that mid-level managers and those with large spans of control spent more time in the leader role than others.

Alternate VI-8: The relationship will be significant for the resource allocator ( $p_8$ ) role.

Subalternate VI-8.1: In this significant relationship, the coefficient  $B_5$  will be greater than the baseline.

Subalternate VI-8.2: In this significant relationship, the coefficient of  $B_6$  will be greater than zero. (Adcock, 1977, p. 140-142)

This overall relationship was significant at the 2.5% level with an adjusted  $R^2$  of 0.379 while Adcock's

results were significant at the 25% level with an adjusted  $R^2$  of 0.165 (1977, p. 253). The Durbin-Watson statistic was 1.92. Thus, the results were indeterminate for autocorrelation. This relationship was represented by

$$p_8 = -0.02730 + 0.05059X_1 + 0.03413X_3 + 0.05156X_5$$

Adcock's relationship was

$$p_8 = 0.05120 + 0.06980X_2$$

Subalternate VI-8.1 was supported in this study; however, Subalternate VI-8.2 was not supported. Likewise,  $B_1$  and  $B_3$  were significant indicating that mid-level managers and staff managers spent more time in this role as did those with larger spans of control. Pavett and Lau (1983) found mid-level managers to perceive the resource allocator role as more important than lower-level managers. Adcock found that only top-level managers spent more time in this role.

There were no alternate hypotheses dealing with the liaison, entrepreneur, and subordinate roles. Each of these is examined individually.

Neither this study nor Adcock's study found any significant relationships dealing with the liaison role. The same is true of the subordinate role. Both studies found significant relationships with the entrepreneur role.

The overall F-tests for the entrepreneur role in both studies were significant. In this study, the overall

results were significant at the 0.5% level with an adjusted  $R^2$  of 0.465 while Adcock's results were significant at the 5% level with an adjusted  $R^2$  of 0.317 (1977, p. 253). The Durbin-Watson statistic for this study was 1.97; therefore, autocorrelation did not exist. This relationship was represented by

$$p_7 = -0.04001 + 0.06899X_2 + 0.04651X_3 + 0.08496X_5$$

while Adcock's results had no significant t-values.

This study found that those at the highest level of the organization, in staff functions, or with the widest spans of control spent more time in this role. Alexander (1979) found that upper-level managers perceived the entrepreneur role as more important as did McCall and Segrist (1980). Adcock's study was unusual in that the overall results were significant at the 5.0% level yet no t-tests were significant.

#### PERSON VARIABLES

This section of the analyses deals with the hypotheses examining person variables.

##### Marginality

Research Hypothesis 3c stated that marginality would affect time in the monitor, disturbance handler, and resource allocator roles. This Research Hypothesis was derived from Research Objective 3 concerning the effects

of person variables. Thus, the following statistical hypothesis was developed.

Null VIII: There is no significant difference in the response distribution among the roles by the group of managers characterized as non-marginal and marginal.

Alternate VIII-1: A significant difference exists between the responses of the marginal managers as a group and the non-marginal managers as a group regarding the monitor ( $p_4$ ) role.

Alternate VIII-2: A significant difference exists between the responses of the marginal managers as a group and the non-marginal managers as a group regarding the combination of the resource allocator ( $p_8$ ) and disturbance handler ( $p_9$ ) roles.

The chi-square values were calculated for the Alternates using the data presented in Table 24. The  $X^2_0$  for Alternate VIII-1 was 0.22 while the  $X^2_{c,2,.05}$  is 5.99. Thus, the null could not be rejected. It appeared that marginality did not affect time in the monitor role.

For Alternate VIII-2, the  $X^2_0$  was 12.58. Thus, the null was rejected in the expected direction with the marginal managers spending more time in these roles than the non-marginal managers.

#### Leadership Orientation

Research Hypothesis 3c stated that leadership orientation affects the manager's distribution of time in the disseminator and leader roles, and this Research Hypothesis was also derived from Research Objective 3. The following statistical hypothesis was tested:

Table 24

## Responses by Marginality for Hypothesis VIII

Respondent Number	Monitor	Resource Allocator	Disturbance Handler	Total Responses
<b>Marginal</b>				
1	45	1	1	120
2	36	8	3	98
3	66	2	0	172
5	62	16	14	212
7	147.5	2	0	200
9	33	1	0	86
11	21	16	2	103
12	48.5	10	6	102
14	12	2	0	61
15	48.5	5	3	122
16	46.5	11	1	168
17	10	5	1	115
20	84	0	0	105
21	44	8	5	155
23	50	3	2	147
26	<u>72.5</u>	<u>11</u>	<u>11</u>	<u>176</u>
Totals	826.5	101	49	2142
<b>Indeterminate</b>				
18	51	6	1	105
24	<u>7</u>	<u>0</u>	<u>1</u>	<u>43</u>
Totals	58	6	2	148
<b>Non-marginal</b>				
4	79	0	5	133
6	24	0	0	67
8	32	12	0	126
10	16.5	1	0	64
13	17.5	3	0	67
19	47	6	3	140
22	79	3	1	182
25	52	0	3	86
27	<u>73</u>	<u>2</u>	<u>0</u>	<u>191</u>
Totals	420	27	12	1056

Null IX: There is no difference in the response distribution among the roles by the group of managers



characterized as task-oriented and the group characterized as relationship-oriented.

Alternate IX-1: A significant difference exists between the response distribution of task-oriented and relationship-oriented managers regarding the combination of task leader ( $p_{2b}$ ) and disseminator ( $p_8$ ) roles.

Alternate IX-2: A significant difference exists between the response distribution of task-oriented and relationship-oriented managers regarding the relationship leader ( $p_{2a}$ ) role.

The data used for the analysis of hypothesis IX is contained in Table 25. For Alternate IX-1, the  $\chi^2_0$  value was 41.59 and the null was rejected in the expected direction. Thus, task-oriented leaders spent more time in these roles than did relationship-oriented leaders as was predicted.

For Alternate IX-2, the null again was rejected; however, the rejection was in the opposite direction than anticipated. The  $\chi^2_0$  value was 18.83. It appeared that in this sample the managers identified as task-oriented spent more time in the relationship leader role than the other managers.

#### Need for Achievement

Research Hypothesis 3b stated that n Ach would affect how managers distributed their time in the entrepreneur and negotiator roles. This Research Hypothesis was derived from Research Objective 3, and the following statistical hypothesis was tested:

Table 25

## Responses by Leadership Orientation for Hypothesis IX

Respondent Number	Task Leader	Disseminator	Relationship Leader	Total Responses
Task-oriented				
2	20	5	0	98
6	4	11	0	67
9	1	18	1	86
11	10	16	24	103
13	14	2	1	67
14	13	0	4	61
15	14.25	16.5	3.25	122
16	29.5	18	2.5	168
20	0	4	0	105
21	35	16	1	155
22	15	33	8	182
26	23	13	3.5	176
Totals	178.75	152.5	48.25	1390
Indeterminate				
3	0	59	0	172
5	32	15	8	212
12	7	4.5	0	102
23	59	6	2	147
24	15	13	1	43
Totals	113	97.5	11	676
Relationship-oriented				
1	5	18	1	120
4	9	18	3	133
7	1	17	0	200
8	22.5	13	2	126
10	13.5	8	0	64
17	4	44	1	115
18	7	10	3	105
19	17	5	3	140
25	1	0	0	86
27	.5	0	0	191
Totals	80.5	133	13	1280

Null X: There is no significant difference in the response distribution among the roles by

the group of managers characterized as having a high n Ach and those with a low n Ach.

Alternate X: A significant difference exists between the responses of the high n Ach managers as a group and the responses of the low n Ach managers as a group regarding the combination of the entrepreneur ( $p_7$ ) and negotiator ( $p_{10}$ ) roles.

The data regarding this role is contained in Table 26. With a  $X^2_0$  value of 3.63, the null could not be rejected. Though there was not a significant difference, the managers with high n Ach spent more time in these roles.

#### Multivariate Analyses

As with statistical hypothesis VI, regression analysis was used to test intra-role variability by doing a multivariate analysis. A total of 13 regressions were run including two for the task leader and relationship leader roles not run in the previous multivariate analysis. The following statistical hypotheses were derived from Research Hypothesis 3 and Research Objective 3. Auto-correlation, heteroscedasticity, and multicollinearity were handled as before. Regarding multicollinearity and the person variables, Table 27 presents the correlations between all the independent variables. Only two added relationships were significant beyond the ones previously discussed. The 0.47 correlation between span of control and leadership style indicated that those with larger spans of control tended to be relationship-oriented. Likewise, those with a larger span of control tended

Table 26

## Responses by n Ach for Hypothesis X

Respondent Number	Entrepreneur	Negotiator	Total Responses
Low n Ach			
7	0	1	200
14	4	2	61
23	5	3	147
24	0	0	43
27	<u>1.5</u>	<u>24</u>	<u>191</u>
Totals	10.5	30	642
Indeterminate			
1	12	2	120
4	0	0	133
5	0	16	212
8	6.5	13	126
9	0	9	86
15	2	3	122
16	17	11	168
18	7	0	105
19	3	8	140
20	1	0	105
21	14	4	155
22	0	12	182
25	1	5	86
26	<u>8</u>	<u>5</u>	<u>176</u>
Totals	71.5	88	1916
High n Ach			
2	8	4	98
3	0	0	172
6	0	2	67
10	10.5	2	64
11	4	0	103
12	12	7	102
13	16	2	67
17	<u>2</u>	<u>4</u>	<u>115</u>
Totals	52.5	21	788

to possess a higher n Ach. For autocorrelation, the Durbin-Watson tables do not go beyond five variables

Table 27  
Correlations between All Variables

Variables	Line/ Staff	Hierarchical Level	Span of Control	Number Supervised	Marginality	Leadership Orientation	n Ach
Line/staff	1.00	.08	.47	.23	-.08	.18	-.04
Hierarchical Level		1.00	.02	-.47	.10	-.18	-.28
Span of Control			1.00	.14	-.06	.47	.34
Number Supervised				1.00	-.15	.20	-.01
Marginality					1.00	-.29	.18
Leadership Orientation						1.00	.17
n Ach							1.00

while each of these regressions had 12 variables. Thus, interpolation to 12 variables was done. The  $d_1$  used was 0.59 while the  $d_u$  value was 2.67.

The basic format of Hypothesis XI was the same as Hypothesis VI with additional variables to account for the person variables.

Null XI: The relationship

$$P_{ij} = B_0 + B_1X_1 + B_2X_2 + B_3X_3 + B_4X_4 + B_5X_5 + B_6X_6 + B_7X_7 + B_8X_8 + B_9X_9 + B_{10}X_{10} + B_{11}X_{11} + B_{12}X_{12} + e$$

where,

$P_{ij}$ ,  $X_1$  to  $X_6$ , and  $e$  are the same as for Null VI

$X_7$  = 1 if respondent is classified as indeterminate regarding marginality; 0 otherwise

$X_8$  = 1 if respondent is classified as marginal; 0 otherwise

$X_9$  = 1 if respondent is classified as indeterminate regarding leadership orientation; 0 otherwise

$X_{10}$  = 1 if respondent is classified as relationship-oriented; 0 otherwise

$X_{11}$  = 1 if respondent is classified as indeterminate regarding n Ach; 0 otherwise

$X_{12}$  = 1 if respondent is classified as high n Ach; 0 otherwise

will not be significant in explaining the intra-role variability for any one of the thirteen roles.

The alternate hypotheses associated with this null are based on the data provided in Tables 20, 21, and 28. The results of each regression analysis and a comparison follow. The same significance criteria used for Hypothesis

Table 28

## Personal Variables by Respondent

Respondent Number	Marginality <sup>#</sup>	Leadership <sup>*</sup> Style	n Ach <sup>a</sup>
1	M	R	I
2	M	T	H
3	M	I	H
4	N	R	I
5	M	I	I
6	N	T	H
7	M	R	L
8	N	R	I
9	M	T	I
10	N	R	H
11	M	T	H
12	M	I	H
13	N	T	H
14	M	T	L
15	M	T	I
16	M	T	I
17	M	R	H
18	I	R	I
19	N	R	I
20	M	T	I
21	M	T	I
22	N	T	I
23	M	I	L
24	I	I	L
25	N	R	I
26	M	T	I
27	N	R	L

<sup>#</sup>M = Marginal, I = Indeterminate, N = Non-marginal

<sup>\*</sup>R = Relationship orientation, I = Indeterminate,  
T = Task orientation

<sup>a</sup>L = Low n Ach, I = Indeterminate, H = High n Ach

VI were used with Hypothesis XI. Where appropriate, organization variables were also discussed as proposed in Hypothesis VI.

Alternate XI-1a: The relationship will be significant for the relationship leader (p<sub>2a</sub>) role.

Subalternate XI-1a: In this significant relationship,  $B_{10}$  will be greater than the baseline.

The statistical results for each of the regressions associated with Hypothesis XI are contained in Table 29. This relationship was not supported and the null could not be rejected.

Alternate XI-1b: The relationship will be significant for the task leader ( $p_{2b}$ ) role.

Subalternate XI-1b: In this significant relationship,  $B_{10}$  will be negative.

The null was rejected for this alternate with a significance level of 10% and an  $R^2_{adj}$  of 0.376. The relationship was

$$p_{2b} = 0.06264 + 0.21253X_4 + 0.21274X_5 - 0.14025X_{11} - 0.18461X_{12}$$

In this significant relationship,  $B_{10}$  was not significant. The Durbin-Watson statistic was 1.71; therefore, no conclusions could be drawn concerning autocorrelation. Instead, it appeared that the two primary determinants of the time a manager spent in the task leader role were span of control and n Ach. The larger the span, the more time spent in the task leader role. The higher the n Ach, the less time a leader spent in the role.

Alternate XI-2: The relationship will be significant for the monitor ( $p_4$ ) role.

Subalternate XI-2: In this significant relationship,  $B_8$  will be greater than the baseline.

The null was rejected at a significance level of 25% and an  $R^2_{adj}$  of 0.280 with the following relationship:



Table 29  
Regression Results on Organization and Person Variables

Role	F	R <sup>2</sup> <sub>adj</sub>	B <sub>0</sub>	B <sub>1</sub> t <sub>1</sub>	B <sub>2</sub> t <sub>2</sub>	B <sub>3</sub> t <sub>3</sub>	B <sub>4</sub> t <sub>4</sub>	B <sub>5</sub> t <sub>5</sub>	B <sub>6</sub> t <sub>6</sub>	B <sub>7</sub> t <sub>7</sub>	B <sub>8</sub> t <sub>8</sub>	B <sub>9</sub> t <sub>9</sub>	B <sub>10</sub> t <sub>10</sub>	B <sub>11</sub> t <sub>11</sub>	B <sub>12</sub> t <sub>12</sub>
Figurehead	13.54 <sup>a</sup>	0.853	-0.01936	0.01601 2.926 <sup>d</sup>	-0.00164 -0.196	0.00773 1.696	0.00427 0.5345	0.01474 1.849 <sup>f</sup>	0.00002 8.697 <sup>a</sup>	-0.00260 -0.320	0.00168 0.393	0.00874 1.479	0.01129 2.107 <sup>f</sup>	-0.00066 -0.111	-0.00134 -0.207
Disturbance Handler	1.15	0.066	0.01075	0.01249 1.003	0.02417 1.262	-0.00698 -0.673	-0.02326 -1.280	-0.01744 -0.961	-0.00001 -1.579	0.00129 0.070	0.00633 0.649	0.02126 1.580	-0.00286 -0.235	0.02586 1.904 <sup>f</sup>	0.01100 0.748
Negotiator	1.04	0.017	0.06856	-0.01912 -0.869	0.02602 0.769	0.01217 0.664	-0.02757 -0.859	-0.01470 -0.458	-0.00001 -1.473	-0.04500 -1.378	-0.01758 -1.021	0.00175 0.074	-0.01835 -0.852	0.01925 0.803	-0.01588 -0.611
Monitor	1.84 <sup>h</sup>	0.280	0.54164	-0.01415 -0.161	0.15615 0.416	0.00667 0.091	-0.29250 -2.286 <sup>e</sup>	-0.33900 -2.652 <sup>d</sup>	0.00006 1.692	0.01753 0.135	0.01026 0.149	0.03856 0.407	-0.02943 -0.343	0.15750 1.647	0.05596 0.540
Disseminator	2.65 <sup>f</sup>	0.433	0.09032	-0.06702 -1.419	-0.08846 -1.219	-0.11800 -3.00 <sup>c</sup>	0.05383 0.781	0.04277 0.621	-0.00001 -0.392	0.14491 2.067 <sup>f</sup>	0.05466 1.478	-0.01001 -0.196	0.04378 0.947	-0.01800 -0.350	0.11140 1.997 <sup>f</sup>
Spokesman	0.92	0.441 <sup>u</sup>	0.25280	-0.11446 -1.996 <sup>f</sup>	-0.12237 -1.389	-0.02072 -0.434	0.08655 1.035	0.02596 0.311	-0.00001 -0.449	-0.04977 -0.585	-0.02057 -0.458	-0.05539 -0.894	-0.01971 -0.351	-0.02964 -0.474	-0.01310 -0.193
Leader	2.74 <sup>f</sup>	0.445	0.03112	0.11645 2.115 <sup>f</sup>	0.02308 0.273	0.06362 1.386	0.20495 2.552 <sup>e</sup>	0.26183 3.264 <sup>c</sup>	-0.00002 -0.797	-0.05046 -0.617	-0.05284 -1.226	0.03336 0.561	-0.01934 -0.359	-0.15413 -2.568 <sup>e</sup>	-0.18775 -2.886 <sup>d</sup>
Relationship Leader	0.63	0.352 <sup>u</sup>	-0.03161	0.05510 1.773 <sup>f</sup>	-0.01156 -0.242	0.02365 0.913	-0.00756 -0.167	0.04914 1.085	0.00000 0.014	0.00382 0.083	0.00475 0.195	-0.00998 -0.297	0.01100 0.362	-0.01388 -0.410	-0.00314 -0.086
Task Leader	2.30 <sup>g</sup>	0.376	0.06264	0.06264 1.169	0.03464 0.429	0.04001 0.914	0.21253 2.775 <sup>d</sup>	0.21274 2.781 <sup>d</sup>	-0.00002 -0.843	-0.15425 -0.696	-0.05761 -1.401	0.04334 0.764	-0.03030 -0.589	-0.14025 -2.450 <sup>e</sup>	-0.18461 -2.976 <sup>d</sup>

<sup>a</sup>Significance  $\leq 0.05\%$

<sup>b</sup>0.05% < Significance  $\leq 0.1\%$

<sup>c</sup>0.1% < Significance  $\leq 0.5\%$

<sup>d</sup>0.5% < Significance  $\leq 1.0\%$

<sup>e</sup>1.0% < Significance  $\leq 2.5\%$

<sup>f</sup>2.5% < Significance  $\leq 5.0\%$

<sup>g</sup>5.0% < Significance  $\leq 10.0\%$

<sup>h</sup>10.0% < Significance  $\leq 25.0\%$

<sup>u</sup>Unadjusted R<sup>2</sup> value

Table 29 (con't)

Role	F	R <sup>2</sup> <sub>adj</sub>	B <sub>0</sub>	B <sub>1</sub> t <sub>1</sub>	B <sub>2</sub> t <sub>2</sub>	B <sub>3</sub> t <sub>3</sub>	B <sub>4</sub> t <sub>4</sub>	B <sub>5</sub> t <sub>5</sub>	B <sub>6</sub> t <sub>6</sub>	B <sub>7</sub> t <sub>7</sub>	B <sub>8</sub> t <sub>8</sub>	B <sub>9</sub> t <sub>9</sub>	B <sub>10</sub> t <sub>10</sub>	B <sub>11</sub> t <sub>11</sub>	B <sub>12</sub> t <sub>12</sub>
Resource	2.10 <sup>g</sup>	0.338	-0.07065	0.05303	0.01812	0.04127	-0.01418	0.04513	-0.00001	0.00511	0.02053	0.01379	0.01937	0.03001	0.02735
Allocator				2.696 <sup>d</sup>	0.599	2.515 <sup>e</sup>	-0.494	1.573	-0.878	0.175	1.332	0.648	1.005	1.398	1.176
Liaison	0.74	0.387 <sup>u</sup>	0.01161	-0.00107	0.00128	-0.00345	0.00284	0.00977	-0.00000	0.00242	-0.00201	-0.00258	0.00227	-0.01250	-0.01460
Entrepreneur	2.25 <sup>g</sup>	0.366	-0.00929	0.00947	0.07166	0.03711	0.07905	0.02944	-0.00001	-0.01186	-0.00605	-0.03295	-0.02268	0.01015	0.02044
Subordinate	0.78	0.402 <sup>u</sup>	0.09275	0.00816	-0.00804	-0.01952	-0.07384	-0.05852	-9.00000	-0.01158	0.00559	-0.01667	0.03552	-0.02793	0.00639
				0.237	-0.152	-0.681	-1.473	-1.168	-0.042	-0.227	0.208	-0.449	1.055	-0.745	0.157

<sup>a</sup>Significance  $\leq 0.05\%$ <sup>b</sup>0.05% < Significance  $\leq 0.1\%$ <sup>c</sup>0.1% < Significance  $\leq 0.5\%$ <sup>d</sup>0.5% < Significance  $\leq 1.0\%$ <sup>e</sup>1.0% < Significance  $\leq 2.5\%$ <sup>f</sup>2.5% < Significance  $\leq 5.0\%$ <sup>g</sup>5.0% < Significance  $\leq 10.0\%$ <sup>h</sup>10.0% < Significance  $\leq 25.0\%$ <sup>u</sup>Unadjusted R<sup>2</sup> value

$$p_4 = 0.54164 - 0.29250X_4 - 0.33900X_5$$

In this relationship,  $B_8$  was not significantly greater than the baseline. The Durbin-Watson statistic was 2.13; therefore, the result on autocorrelation was indeterminate. Span of control appeared to determine the amount of time in this role. The larger the span of control, the less time one spent in the monitor role. In Hypothesis VI-4, it was stated the  $B_3$  would be greater than the baseline. This was not supported in either monitor regression using this data.

Alternate XI-3: The relationship will be significant for the disseminator ( $p_5$ ) role.

Subalternate XI-3: In this significant relationship,  $B_{10}$  will be negative.

The overall relationship was significant at the 5 percent level and with an  $R^2_{adj}$  of 0.433. The relationship was represented by

$$p_5 = 0.09032 - 0.11799X_3 + 0.14491X_7 + 0.11140X_{12}$$

The Durbin-Watson statistic was 1.76; therefore, no conclusion concerning autocorrelation could be made. Sublternate XI-3 was not supported though. Instead, line managers appeared to spend much less time in this role than did staff managers. Those whose marginality was indeterminate and those with high n Ach spent more time in this role. In Alternate VI-5, it was hypothesized that  $B_3$  would be greater than zero,  $B_5$  would be greater than  $B_4$  which would be greater than the baseline, and

finally  $B_6$  would be greater than zero. None of the hypotheses were supported in this regression.

Alternate XI-4: The relationship will be significant for the entrepreneur ( $p_7$ ) role.

Subalternate XI-4: In this significant relationship,  $B_{12}$  will be greater than the baseline.

This relationship was significant at the 10 percent level with an  $R^2_{adj}$  of 0.366. The Durbin-Watson statistic was 1.90; therefore, the evidence on autocorrelation was inconclusive. The relationship was represented by

$$p_7 = -0.00929 + 0.07905X_4$$

The subalternate was not supported since  $B_{12}$  was not significant. The major variable affecting time in this role appears to be a large span of control.

Alternate XI-5: The relationship will be significant for the resource allocator ( $p_8$ ) role.

Subalternate XI-5: In this significant relationship,  $B_8$  will be negative.

This relationship was significant at the 10 percent level with an  $R^2_{adj}$  of 0.338. The Durbin-Watson statistic was 1.81 - again in the indeterminate range. The relationship was represented by

$$p_8 = -0.07065 + 0.05309X_1 + 0.04127X_3$$

Thus, the subalternate was not supported. In fact, it appeared that those at the middle hierarchical level and those on the staff spent more time in this role than did others. In Alternate VI-8, it was hypothesized that

$B_5$  would be greater than the baseline and that  $B_6$  would be greater than zero. Neither was supported.

Alternate XI-6: The relationship will be significant for the disturbance handler ( $p_9$ ) role.

Subalternate XI-6: In this significant relationship,  $B_8$  will be greater than the baseline.

The overall relationship was not significant.

Alternate XI-7: The relationship will be significant for the negotiator ( $p_{10}$ ) role.

Subalternate XI-7: In this significant relationship,  $B_{12}$  will be positive.

The overall relationship was not significant.

There were no alternate hypotheses for the figurehead, leader, liaison, spokesman, and subordinate roles.

Each of these roles is discussed.

The overall results for the figurehead ( $p_1$ ) role were significant at the 0.1% level with an  $R^2_{adj}$  of 0.853. The Durbin-Watson statistic was 1.85 which is in the indeterminate range. The relationship was

$$p_1 = -0.01936 + 0.01601X_1 + 0.01474X_5 + 0.00002X_6 + 0.01129X_{10}$$

The significant variables indicated that those at the middle hierarchical level, with the highest span of control, or with more subordinates spent more time in this role than did others. Adcock's position that  $B_1$  would be greater than zero was supported: however, his position that  $B_2$  would be greater than  $B_1$  was not supported.

The overall results for the leader ( $p_2$ ) role was significant at the 5% level. The  $R^2_{adj}$  was 0.445. The Durbin-Watson statistic was 1.53 which was in the indeterminate range. The relationship was

$$p_2 = 0.03112 + 0.11645X_1 + 0.20495X_4 + 0.26183X_5 \\ - 0.15403X_{11} - 0.18775X_{12}$$

In this relationship, it appeared that time in this role was explained by being at a mid-hierarchical level. Likewise, the wider one's span of control, the more likely a manager is to spend more time in this role. Also, a higher n Ach tends to decrease one's time in this role. Subalternate VI-6.1 was supported since  $B_5$  was larger than  $B_4$  which was larger than zero. The hypothesis concerning  $B_6$  was not supported.

The relationships for the liaison, spokesman, and subordinate roles were insignificant.

#### COMBINED EFFECTS

One could have reasonably expected combined effects to occur in this sample. The following statistical hypotheses all were derived from Research Objective 3.

#### Marginality/First Line Supervision

Null XII: There is no significant difference in the response distribution among the roles by the group of managers characterized as marginal, first line supervisors and all others.

Alternate XII-1: A significant difference exists between the responses of the marginal, first

line supervisors as a group and all others regarding the monitor ( $p_4$ ) role.

Alternate XII-2: A significant difference exists between the responses of the marginal, first line supervisors as a group and all others regarding the combination of the resource allocator ( $p_8$ ) and disturbance handler ( $p_9$ ) roles.

The data used in the analysis for Hypothesis XII are contained in Table 30. In neither case could the null be rejected. The  $X^2_0$  for Alternate XII-1 was 1.55 while the  $X^2_0$  for Alternate XII-2 was 0.44. The  $X^2_c$  value was 3.84.

#### High n Ach/Mid-hierarchical Level

Null XIII: There is no significant difference in the response distribution among the roles by the group of managers characterized as high n Ach, middle-level and all others.

Alternate XIII: A significant difference exists between the response of the high n Ach, middle-level managers as a group and all other managers as a group regarding the combination of the entrepreneur ( $p_7$ ) and negotiator ( $p_{10}$ ) roles.

The data used in this analysis are contained in Table 31. The  $X^2_0$  for Alternate XIII was 4.27. Thus, the null was rejected in the expected direction. The high n Ach, middle-level managers did spend more time in these roles as predicted.

#### PUBLIC VERSUS PRIVATE

Research Hypothesis 2 addressed the difference in how private and military/government managers distribute their time between roles and was derived from Research

Table 30

Responses by Marginality/Hierarchical Level  
for Hypothesis XII

Respondent Number	Monitor	Resource Allocator	Disturbance Handler	Total Responses
Marginal/Level 3				
1	45	1	1	120
2	36	8	3	98
3	66	2	0	172
5	62	16	14	212
7	147.5	2	0	200
9	33	1	0	86
14	12	2	0	61
16	46.5	11	1	168
17	<u>10</u>	<u>5</u>	<u>1</u>	<u>115</u>
Totals	458	48	20	1232
All Others				
4	79	0	5	133
6	24	0	0	67
8	32	12	0	126
10	16.5	1	0	64
11	21	16	2	103
12	48.5	10	6	102
13	13	17.5	3	67
15	48.5	5	3	122
18	28	6	1	105
19	47	6	3	140
20	84	0	0	105
21	44	8	5	155
22	79	3	1	182
23	50	3	2	147
24	7	0	1	43
25	52	0	3	86
26	72.5	11	11	176
27	<u>73</u>	<u>2</u>	<u>0</u>	<u>191</u>
Totals	846.5	86	43	2114

Objective 2. To study this issue, the following statistical hypothesis was developed:

Null: XIV: Managers in the public sector and managers in the private sector distribute their time among roles the same.



Table 31

Responses by n Ach/Hierarchical Level for Hypothesis XIII

Respondent Number	Entrepreneur	Negotiator	Total Responses
High n Ach/Level 2			
11	4	0	103
13	<u>16</u>	<u>2</u>	<u>67</u>
Totals	20	2	170
All Others			
1	12	2	120
2	8	4	98
3	0	0	172
4	0	0	133
5	0	16	212
6	0	2	67
7	0	1	200
8	6.5	13	126
9	0	9	86
10	10.5	2	64
12	12	7	102
14	4	2	61
15	2	3	122
16	17	11	168
17	2	4	115
18	7	0	105
19	3	8	140
20	1	0	105
21	14	4	155
22	0	12	182
23	5	3	147
24	0	0	43
25	1	5	86
26	8	5	176
27	<u>1.5</u>	<u>24</u>	<u>191</u>
Totals	114.5	137	3176

Alternate XIV: Managers in the public sector and managers in the private sector distribute their time among the roles differently.

To analyze this issue one needed to examine the responses in both this study and Adcock's study. Table 32 contains

Table 32

## Distribution by Role

Role	This Study		Adcock's Study		Percent Difference
	Percent	Number	Percent	Number	
Figurehead	1.0	35	0.8	36	0.2
Leader	13.3	444.5	13.7	618.5	0.4
Liaison	0.4	14	0.4	16	0.0
Monitor	39.0	1304.5	38.4	1733.5	0.6
Disseminator	11.4	383	9.8	441.5	1.6
Spokesman	17.6	589	19.5	878.5	1.9
Entrepreneur	4.0	134.5	3.1	139	0.9
Resource Allocator	4.0	134	4.5	202	0.5
Disturbance Handler	1.9	63	0.5	24	1.4
Negotiator	4.2	139	3.8	171	0.4
Subordinate	3.2	105.5	5.5	250	2.3
Totals	100.0	3346.0	100.0	4510.0	

this data. Using a chi-square test with 10 degrees of freedom, the critical value was 18.3 at the 0.05 level. The  $X^2_0$  was 70.08. Thus, the null was rejected. To determine specifically which roles were different the  $X^2$  for each role was calculated. If the value was greater than 3.84, the difference was significant at the 5% level. The difference was significant for four roles: disturbance handler, subordinate, disseminator, and entrepreneur. The corresponding  $X^2_0$  values were 30.45,

23.72, 4.87, and 4.58. Thus, the disturbance handler and subordinate roles accounted for most of the difference. Interestingly, the reliability of the disturbance handler role in this study was 0.483 which was minimally acceptable while the reliability of the subordinate role in Adcock's study was 0.342 which he termed very poor (1977, p. 214). There appeared to be very little difference in the overall time distribution by role between the two samples when looking strictly at percentages. The largest difference was found in the subordinate role where it appeared that public sector managers spent 2.3 percent less time in the role than did the private managers. The next largest difference was associated with the spokesman role. Again, the public sector managers spent roughly 1.9 percent less time in this role than the private sector managers. The public managers spent 1.6 percent more time in the disseminator role than did the private managers. The differences for the other roles were minor. For all intents and purposes, it appears that public sector managers and private managers in these two studies distributed their time among the roles relatively the same when considering only the roles whose reliabilities were acceptable.

#### SUMMARY

The results of this study were compared with Adcock (1977) and are summarized below. The univariate analysis

summary is presented first, followed by the multivariate analysis.

### Univariate Analyses

Hypotheses I to V, VII to X, and XII to XIV were tested via univariate tests. Hypotheses I to V and VII were tested in both this study and Adcock's study. Table 33 summarizes these tests.

Hypothesis I tested whether the time allocation of the managers was uniform across roles. The results of both studies rejected the null in favor of the alternate stating that the distribution was nonuniform.

Hypothesis II first tested to see if managers at higher hierarchical levels spent more time in the figurehead role than those at lower levels. Both studies again supported the hypothesis that higher level managers spent more time in this role.

Hypothesis III first tested to see if managers at lower hierarchical levels spent more time in the disturbance handler and negotiator roles than higher level managers. This study's results were inconclusive while Adcock's study found that higher level managers spent more time in these roles.

Hypothesis III then tested to determine if staff managers spent more time in the informational roles than did line managers. The results of the two studies were contradictory. This study found that line managers spent

Table 33

## Summary of Univariate Analyses

Null Hypothesis	Adcock	This Study
<u>Roles</u>		
I: Roles are uniformly distributed	Rejected	Rejected
V: <u>Subordinate</u> does not exist	Rejected	Rejected
VII: One or more roles do not exist	Rejected	Rejected
<u>Organization Variables</u>		
II-1: Hierarchical level and <u>figurehead</u> role	Rejected in the expected direction	Rejected in the expected direction
II-2: Hierarchical level and <u>disturbance handler</u> and <u>negotiator</u> roles	Rejected in the opposite direction	Not rejected
III-1: Line/staff with <u>disturbance handler</u> and <u>negotiator</u> roles	Rejected in the opposite direction	Not rejected
III-2: Line/staff with <u>monitor</u> , <u>disseminator</u> , and <u>spokesman</u> roles	Rejected in the expected direction	Rejected in the opposite direction
IV: Span of control and <u>leader</u> , <u>disseminator</u> , <u>resource allocator</u> , and <u>disturbance handler</u> roles	Rejected in the expected direction	Rejected in the expected direction
<u>Person Variables</u>		
VIII-1: Marginality and <u>monitor</u> role	Not applicable	Not rejected
VIII-2: Marginality and <u>resource allocator</u> and <u>disturbance handler</u> roles	Not applicable	Rejected in the expected direction

Table 33 (con't)

Null Hypothesis	Adcock	This Study
IX-1: Leadership orientation and <u>task leader</u> and	Not applicable	Rejected in the expected direction
IX-2: Leadership orientation and <u>relationship leader</u> role	Not applicable	Rejected in the opposite direction
X: n Ach and <u>entrepreneur</u> and <u>negotiator</u> roles	Not applicable	Not rejected
<u>Combined Effects</u>		
XII-1: Marginality/first line supervision and <u>monitor</u> role	Not applicable	Not rejected
XII-2: Marginality/first line supervision and <u>resource allocator</u> and <u>disturbance handler</u> roles	Not applicable	Not rejected
XIII: High n Ach/mid-hierarchical level and <u>entrepreneur</u> and <u>negotiator</u> roles	Not applicable	Rejected in the expected direction
<u>Private versus Public</u>		
XIV: No difference in time allocation by role	Not applicable	Rejected

more time in these roles than staff managers while Adcock's study found just the opposite.

Hypothesis IV tested the hypothesis that those with a larger span of control spent more time in the leader, disseminator, resource allocator, and disturbance handler

roles than those with smaller spans of control. Both studies found the hypothesis to be true.

The next hypothesis, V, tested whether or not the subordinate role existed. Both studies supported its existence.

The hypothesis that all roles existed was tested by Hypothesis VII. Both studies supported the existence of all roles.

Hypothesis VIII first tested that marginal individuals spent more time in the monitor role. The hypothesis was not supported.

Hypothesis VIII then tested whether marginal individuals spent more time in the resource allocator and disturbance handler roles. The hypothesis was supported.

Hypothesis IX tested whether or not task-oriented managers spent more time in the task leader and disseminator roles. The hypothesis that they would do so was supported.

Hypothesis IX also tested the hypothesis that relationship-oriented leaders spent more time in the relationship leader role. The opposite was significant. It appeared that the task-oriented leaders spent more time in this role than the others.

Hypothesis X tested whether individuals with high n Ach spent more time in the entrepreneur and negotiator roles than did others. The results were inconclusive.

Hypothesis XII was the first to examine combined effects. It tested to determine whether marginal, first-line supervisors spent more time in the monitor role than others. The results were inconclusive.

Hypothesis XII then tested whether or not marginal, first-line supervisors spent more time in the resource allocator and disturbance handler roles than did others. Again, the results were inconclusive.

Hypothesis XIII tested whether high n Ach, middle-level managers spent more time in the entrepreneur and negotiator roles than did others. The hypothesis was supported.

Hypothesis XIV tested to determine if public and private sector managers distributed their time among the roles the same. Statistically, they did not. The time distribution was different on four roles: disturbance handler, subordinate, disseminator, and entrepreneur. However, the reliabilities of the disturbance handler role in this study and the subordinate role in Adcock's study were questionable, and these roles contributed largely to the observed chi-square value. Thus, one could argue that there may be no difference in role allocation between public and private managers.

#### Multivariate Analyses

Three different multivariate analyses were performed in this study and in Adcock's study. In each study,



Hypothesis VI dealt with the effects of organization variables on how managers distributed their time to a role. In this study, Hypothesis XI examined the effects of both organization and person variables. Table 34 summarizes the results of the two studies for the roles in which any overall significant findings resulted. Since the regressions were run on each role, the results are presented by role.

For four roles, no significant findings resulted. These roles were relationship leader, liaison, negotiator, and subordinate.

In examining the results for the figurehead role, all three regressions were significant with a 0.1 percent significance in this study for the organization alone and for the organization and person combined and at 5 percent in Adcock's study. The results were consistently insignificant for the following variables: line/staff, marginality, and n Ach. Hierarchical level was significant in all three regressions indicating that higher level managers spent more time in this role than lower level managers. Number of subordinates was the most significant variable in this study, indicating that as the number increased so did the time in this role. Span of control was also significant in the regression on organization and person variables, indicating that those with the largest span spent more time in the role. Finally, leadership orientation

Table 34  
Summary of Multivariate Analyses

Role	Regression	Sig <sup>*</sup>	R <sup>2</sup> <sub>adj</sub>	X <sub>1</sub>	X <sub>2</sub>	X <sub>3</sub>	X <sub>4</sub>	X <sub>5</sub>	X <sub>6</sub>	X <sub>7</sub>	X <sub>8</sub>	X <sub>9</sub>	X <sub>10</sub>	X <sub>11</sub>	X <sub>12</sub>
Figurehead	A	5	0.359	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	RO	.1	0.358	2.5+	NS	NS	NS	NS	.05+	NS	NS	NS	NS	NS	NS
	ROP	.1	0.353	1.0+	NS	NS	NS	5+	.05+	NS	NS	NS	5+	NS	NS
Leader	A	NS	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
	RO	10	0.238	5+	NS	NS	NS	2.5+	NS	NS	NS	NS	NS	NS	NS
	ROP	5	0.445	5+	NS	NS	2.5+	.5+	NS	NS	NS	NS	NS	2.5-	1-
Task Leader	ROP	10	0.376	NS	NS	NS	1+	1+	NS	NS	NS	NS	NS	2.5-	1-
Monitor	A	NS	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
	RO	2.5	0.368	NS	NS	NS	2.5-	.5-	2.5+	NS	NS	NS	NS	NS	NS
	ROP	25	0.280	NS	NS	NS	2.5-	1-	NS	NS	NS	NS	NS	NS	NS
Disseminator	A	NS	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
	RO	25	0.197	NS	NS	5-	NS	NS	NS	NS	NS	NS	NS	NS	5+
	ROP	5	0.433	NS	NS	.5-	NS	NS	NS	5+	NS	NS	NS	NS	5+
Spokesman	A	25	0.200	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	RO	25	0.176	2.5+	5-	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	ROP	NS	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Entrepreneur	A	10	0.317	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	RO	0.5	0.465	NS	5+	2.5+	2.5+	NS	NS	NS	NS	NS	NS	NS	NS
	ROP	10	0.366	NS	NS	NS	5+	NS	NS	NS	NS	NS	NS	NS	NS
Resource Allocator	A	25	0.165	NS	5+	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	RO	2.5	0.379	.5+	NS	2.5+	NS	2.5+	NS	NS	NS	NS	NS	NS	NS
	ROP	10	0.338	1+	NS	2.5+	NS	NS	NS	NS	NS	NS	NS	NS	NS
Disturbance Handler	A	2.5	0.437	NS	NS	NS	NS	NS	5+	NS	NS	NS	NS	NS	NS
	RO	NS	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
	ROP	NS	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

# A = Adcock's study; RO = This study-organizational variables only; ROP = This study-organizational and personal variables

\*Significance level in percent. The numbers under the independent variables represent significance in percent and the direction of that significance.

X<sub>1</sub> = middle hierarchical level; X<sub>2</sub> = highest hierarchical level; X<sub>3</sub> = staff; X<sub>4</sub> = mid-span of control; X<sub>5</sub> = large span of control; X<sub>6</sub> = number of subordinates; X<sub>7</sub> = indeterminate marginality; X<sub>8</sub> = marginal; X<sub>9</sub> = indeterminate leadership orientation; X<sub>10</sub> = relationship leadership orientation; X<sub>11</sub> = indeterminate n Ach; X<sub>12</sub> = high n Ach

appeared significant in the organization and person variable regression. Relationship-oriented leaders spent more time in this role than the others.

Both regressions in this study were significant for the leader role although Adcock's regression was not. The regression on both organization and person variables was significant at the 5 percent level while the regression on the organization variables alone was significant at the 10 percent level. The line/staff, number of subordinates, marginality, and leadership style variables were insignificant. Span of control was significant with those having larger spans spending more time in this role. Likewise, hierarchical level was significant with those at mid-level spending more time in this role. Interestingly,  $n$  Ach also was significant and as  $n$  Ach increased, time in this role also decreased. This is consistent with some research showing that those with high  $n$  Ach have no time for people.

In examining the results for the task leader role, the results of this study were significant at the 10 percent level with an  $R^2_{adj}$  of 0.376. In this relationship, two variables accounted for most of the variability. A larger span of control caused one to spend more time in this role while one spent less time in this role as one's  $n$  Ach increased.

In this study, both regressions for the monitor role were significant; however, Adcock's regression was not. The regression on organization variables was significant at the 2.5 percent level with an  $R^2_{adj}$  of 0.368 while the regression on both sets of variables yielded a significance level of 25 percent and an  $R^2_{adj}$  of 0.280. As one had a larger span of control, he spent less time in this role. However, as one had more subordinates he spent more time in this role.

Relative to the disseminator role, the results of this study were significant while Adcock's results were not significant. The regression on all variables was significant at the 5 percent level with an  $R^2_{adj}$  of 0.433. The regression on only the organization variables was significant at the 25 percent level with an  $R^2_{adj}$  of 0.197. The results indicated that those in a staff position spent less time in this role while those with high n Ach or indeterminate marginality spent more time in this role.

Both regressions on organization variables only were significant for the spokesman role at a 25 percent level with  $R^2_{adj}$  of 0.176 in this study and 0.200 in Adcock's study. The variation was accounted for by hierarchical level with time in this role decreasing as one went up the hierarchy.

All regressions were significant for the entrepreneur role. This study's regression using organization variables

was significant at the 0.5 percent level with an  $R^2_{adj}$  of 0.465. The other two regressions were significant at the 10 percent level with  $R^2_{adj}$  of 0.366 in this study and 0.317 in Adcock's study. Managers spent more time in this role if they were at the highest hierarchical level, on the staff, or had an intermediate span of control.

The regressions for the resource allocator role were all significant with the organization variables being significant at the 2.5 percent level and with an  $R^2_{adj}$  of 0.379. This study's regression on all variables was significant at the 10 percent level with an  $R^2_{adj}$  of 0.338. Finally, Adcock's results were significant at the 25 percent level with an  $R^2_{adj}$  of 0.165. In examining the independent variables, it appeared that all the organization variables affected the time in this role. As one went up the hierarchy, was on the staff, or increased in span of control, one spent more time in this role.

For the disturbance handler role, only Adcock's results were significant. They were significant at the 2.5 percent level with an  $R^2_{adj}$  of 0.437. The variation was explained by the number of subordinates, i.e., the more subordinates, the more time in this role.

A synopsis of all the foregoing results is as follows. The managers did distribute their time differently among the roles; and all roles, including the subordinate role, existed. Some organization variables did play a

major role in how the managers distributed their time among the roles. Hierarchical level affected time in the figurehead and the resource allocator roles. Span of control was a significant variable in that it affected time in the leader, disseminator, resource allocator, and disturbance handler roles. The person variables also had some affect on the time in roles. The relationship-oriented managers spent more time in the figurehead role. Also, the higher a manager's  $n$  Ach, the less time he spent in the leader role and the more time he spent in the disseminator role. In examining combined effects, it appeared that mid-level managers with high  $n$  Ach spent more time in the entrepreneur and negotiator roles. Though there appears to be some contradictions and inconsistencies within this study and between this study and Adcock's study, certain conclusions can be drawn. Likewise, recommendations for future research in this area can be made. Chapter 5 addresses these matters.

## CHAPTER 5

### SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

This Chapter is divided into three primary sections. The first section summarizes the results of this and Adcock's research. The second section draws conclusions from the results. The final section of the Chapter recommends further research into Mintzberg's role concept using the modified activity sampling methodology. These three sections are preceded by restatement of the Research Objectives and Hypotheses of this study.

The Research Objectives were:

1. To use Adcock's modified activity sampling methodology to detect the role behavior of practicing government/military managers,
  - a. To verify that government/military managers do act in all eleven (Mintzberg's ten and Adcock's subordinate role) and to estimate the proportion of time spent in each role and thus verify that Adcock's methodology detects all eleven roles, *and*
  - b. To determine the contribution of four organization variables examined by Adcock to the variability in how the government/military managers distribute their time in roles.
2. To detect differences between private (Adcock's sample) and government/military managers regarding their role behavior.
3. To determine the contribution of selected organization variables, person variables, and combined effects to the total variability in how government/military managers distribute their time in roles.

Additionally, from each of the above Objectives, specific Research Hypotheses were derived:

1a. Military/government managers do act in all eleven roles though at different levels due to the effect of certain variables.

1b. Organization variables affect how managers distribute their time among roles.

(1) Hierarchical level will affect time in the figurehead, disturbance handler, and negotiator roles.

(2) Span of control will affect time in the leader, disseminator, resource allocator, and disturbance handler roles.

(3) Line versus staff will affect time in the disturbance handler, negotiator, monitor, disseminator, and spokesman roles.

(4) Size of unit supervised will affect time in the disseminator, disturbance handler, and leader roles.

2. Private managers (using Adcock's sample) will distribute their time among the roles differently than military/government managers.

3. Person variables will affect how managers distribute their time among roles.

a. Leadership orientation will affect time in the disseminator and leader roles.

b. Need for achievement will affect time in the entrepreneur and negotiator roles.

c. Marginality will affect time in the monitor, disturbance handler, and resource allocator roles.

#### SUMMARY OF SIGNIFICANT FINDINGS

To summarize the significant findings of this research, each Research Hypothesis is discussed. No significance



was attached to the negotiator and liaison roles from this study since their split-half reliability scores, 0.267 and 0.366 respectively, were low. Also, the significance of the disturbance handler role was marginally acceptable.

#### Time Distribution among the Roles

Research Hypothesis 1a stated that military/government managers do act in all eleven roles though at different levels due to the effect of certain variables. The military/government managers did act in all eleven roles in a non-uniform manner. In this study, the managers spent the least time (0.4%) in the liaison followed by the figurehead (1.0%) role and the most time (39.0%) in the monitor role. Adcock's results were similar. His respondents spent the least time (0.4%) in the liaison role and the most (38.4%) in the monitor role. Both studies fully supported the hypothesis that managers do not distribute their time uniformly among the roles.

#### The Effects of Organization Variables

Research Hypothesis 1b stated that organization variables affect how managers distribute their time among roles. The significant findings for each organization variable studied follow.

Hierarchical level. Research Hypothesis 1b(1) stated that hierarchical level would affect time in the

figurehead, disturbance handler, and negotiator roles.

Since the reliability for the negotiator role was low, no significant findings can be drawn from this study for that role. Likewise, due to a split-half reliability of 0.483 for the disturbance handler role, its significance relative to hierarchical level is questionable.

For the figurehead role, one can safely conclude that the role was affected by hierarchical level. Using the univariate analysis, the evidence in both studies indicated that the higher the level in the management hierarchy, the more time a manager spent in this role. Adcock's multivariate analysis supported this finding, with hierarchical level explaining 35.9 percent of the variation. The multivariate analyses in this study were not completely in agreement with Adcock.

The regression on the organization variables was significant at the 0.1 percent level and explained 85.8 percent of the variation. However, those managers at the mid-level spent more time in the figurehead role than did the others. Also, while mid-level hierarchical results were significant at the 2.5 percent level, the total number of subordinates was significant at the 0.05 percent level. In the regression on organization and person variables, again the mid-level results were significant but at the 1.0 percent level while number supervised was significant at the 0.05 percent level. The effects of

the largest span of control and relationship-orientation were significant at the 5 percent level.

The evidence at this point indicated that hierarchical level was important to the figurehead role; however, multicollinearity effects seemed to be present. It was anticipated that those managers at the highest levels of the organization would spend more time in this role. However, the effect of the top hierarchical level was not significant in either regression of this study while the number supervised was significant. A correlation analysis indicated that the correlation between these two variables was 0.59. Thus, multicollinearity may have kept the top hierarchical level from being significant. Another possible explanation for the difference between the two studies lies in the level of managers sampled. Adcock sampled lower- and mid-level managers only. He arbitrarily split this group into three levels. In this study, the sample truly included upper-level managers. Thus, direct comparison between the two studies may not be appropriate, because the upper-level managers in Adcock's study were more comparable to the mid-level managers in this study. In general, it appears that Mintzberg's Proposition 7 stating that lower-level managers spend less time in the figurehead role was supported.

In this study, no significant results were found for the disturbance handler role, perhaps because its split-

half reliability of 0.483 was marginally low. Adcock did find that the number of subordinates was significant. But from this study, one must concede that hierarchical level did not affect the time in the disturbance handler role. This contradicted Mintzberg's belief that lower-level managers would spend more time in this role as he espoused in his Proposition 8.

Span of control. Research Hypothesis 1b(2) hypothesized that a manager's span of control will affect time in the leader, disseminator, resource allocator, and disturbance handler roles.

In the univariate analyses of this research and Adcock's research, span of control did have an effect on the combination of the above four roles. As span increased the time in the combination of roles increased. In examining the regression analyses, one observes some inconsistencies and some similarities between the two studies.

Adcock's regression analysis on the leader role was not significant though both regressions in this study were significant for the leader role. The regression on all variables was significant at the 5 percent level with 44.5 percent of the variation explained by mid-level hierarchy, span of control, and n Ach. As the span increased, the time in the leader role increased. The other results for span of control were less clear.

There were no significant results relating span of control with either the disseminator or disturbance handler roles. Though Adcock's regression and both the regressions in this study found significant results for the resource allocator role, span of control was significant in only one regression. The regression on organization variables in this study was significant at the 2.5 percent level with 37.9 percent of the variation explained. Those with the largest span of control spent more time in this role than the others, which is what Adcock had predicted. However, no general conclusions regarding span of control and the resource allocator role can be made.

Line versus staff. Research Hypothesis 1b(3) stated that line versus staff affects the disturbance handler, negotiator, monitor, disseminator, and spokesman roles.

This study found from the univariate analysis that time in the informational roles was higher for line managers than staff managers. Adcock's study supported Mintzberg's Proposition 14 and found just the opposite. This contradiction could have resulted simply from differences in definition of line versus staff. As stated before, the differentiation between line and staff is not clearcut. Because the classification scheme used in this study was conservative in its definition of line, the results may have differed accordingly. This study

failed to support Mintzberg's Proposition 14 since line managers spent more time in the informational roles. The univariate analysis on disturbance handler and negotiator failed to reject the null, but the reliability for the negotiator role was low and that for the disturbance handler was only marginally acceptable.

Specifically, no significant multivariate results were found for the disturbance handler, monitor, or spokesman roles regarding line or staff positions. Though Adcock did not find any relationship between the disseminator and line versus staff, this study did. The regression for the disseminator role on all variables was significant at the 5 percent level with 43.3 percent of the variation explained. It was found that staff managers spent less time in the disseminator role. This result is contradictory to Mintzberg's Proposition 14 (1973, p. 131). Again, this disparity may be due to the conservative definition of line used in this study.

Size of unit supervised. Research Hypothesis 1b(4) stated that the size of the unit supervised will affect time in the disseminator, disturbance handler, and leader roles.

No relationship was found between size of unit supervised and the disseminator or leader roles. In this study, no significant relationship was found between size and the disturbance handler role though Adcock's

regression on this role was significant at the 2.5 percent level with 43.7 percent of the variation explained. Again, the split-half reliability for the disturbance handler role was just marginally acceptable in this study. The failure to find significant results may be attributable to the low reliability. Thus, no general significance was attributed to the size of unit supervised relative to these three roles.

#### Public versus Private

Research Hypothesis 2 stated that private managers (using Adcock's sample) will distribute their time among the roles differently than military/government managers.

Statistically, the above Research Hypothesis was supported; however, three of the roles that contributed the highest values to the test statistic were low in reliability - negotiator and liaison in this study and subordinate in Adcock's study. The fourth variable was this study's disturbance handler role which had a marginally satisfactory reliability. If these roles are ignored, there is no statistical difference between the two studies.

Table 35 presents the comparison of time spent in each role. The difference was less than one percent for six of the roles: figurehead (0.2%), leader (0.4%), liaison (0.0%), monitor (0.6%), entrepreneur (0.9%), and resource allocator (0.5%). For three roles the difference was between one and two percent: disseminator

Table 35

## Percentage Time Distribution by Role for Three Studies

Role	This Study	Adcock	Scott <sup>*</sup>
Figurehead	1.0	0.8	2.4
Leader	13.3	13.7	24.4
Liaison	0.4	0.4	5.8
Monitor	39.0	38.4	27.1
Disseminator	11.4	9.8	5.4
Spokesman	17.6	19.5	5.0
Entrepreneur	4.0	3.1	8.4
Resource Allocator	4.0	4.5	3.7
Disturbance Handler	1.9	0.5	6.7
Negotiator	4.2	3.8	5.1
Subordinate	<u>3.2</u>	<u>5.5</u>	<u>6.0</u>
Total	100.0	100.0	100.0

\* Figures adjusted to delete unknown and other roles.

(1.6%), spokesman (1.9%), and disturbance handler (1.4%).

Only one role was above two percent: the subordinate at 2.3 percent.

These results are comparable to the results that Scott (1983) had in her study of a middle-level public service manager and a middle-level public education manager. When examining the percent time spent in each role by each manager, she found no significant difference (p. 48-50).



There were large differences between the percentages that Scott found and the percentages in this study. Table 35 also gives the time percentages for Scott's public service manager. One would not necessarily expect the same results since Scott's results (as shown in Table 35) were based on one person rather than a much larger sample as in this and Adcock's study.

At this point, one cannot generalize these results to all management situations. It does appear that there is little difference between this study and Adcock's study. Both of these studies dealt with organizations involving technical personnel and tasks. Adcock's respondents made technical preparations for missile launches. The organization in this study managed and repaired weapon systems. The respondents in Scott's study provided a public service of a relatively non-technical nature. Likewise, Scott may have found no difference in time in roles between the public education manager and the public service manager since they both provide a 'service'. Thus, the technical nature of the organizations may have contributed to the differences between these two studies and Scott's study.

#### The Effects of Person Variables

Hypothesis 3 stated that person variables will affect how managers distribute their time among roles. Specific

effects due to specific variables were expected and these follow.

Leadership orientation. Research Hypothesis 3a stated that leadership orientation will affect time in the disseminator and leader roles. The results were mixed for this variable. In the univariate analysis of data, it was found that the task-oriented leaders spent more time in the combination of disseminator and task leader roles which was consistent with theory. However, the relationship-oriented leaders did not spend more time in the relationship leader role. In fact the task-oriented managers spent more time in this role.

The regression results yielded no significant relation between leadership orientation and the disseminator, task leader, relationship leader, or the leader roles though other variables did in fact explain the variation in these roles. As a matter of fact, leadership orientation was only significant for the figurehead role.

The overall regression for the figurehead role on all variables was significant at the 0.1 percent level with 85.3 percent of the variation explained. In this relation, the relationship-oriented variable was significant at the 5 percent level indicating that relationship-oriented managers spent more time in the figurehead role. This is not entirely surprising when one considers the behaviors of relationship-oriented managers. They

might choose to participate more frequently in ceremonies to present awards and decorations to their subordinates. Thus, one may conclude that leadership orientation was significant in explaining time in the figurehead role.

Need for achievement. Research Hypothesis 3b stated that n Ach will affect time in the entrepreneur and negotiator roles. Since the reliability of the negotiator role was low, no significance could be attached to this role. Though the regression on the entrepreneur role was significant, the n Ach variables were not. However, n Ach was significant for other roles.

For both the leader and task leader roles the n Ach variables were significant. The results indicated that individuals with higher n Ach spent less time in each of these roles. This is consistent with research indicating that high n Ach individuals have little time for people. Likewise, the high n Ach variable was significant in the disseminator role with the high n Ach managers spending significantly more time in this role. Again, assuming that these managers might spend more time providing guidance and direction to their subordinates, this result is consistent with the expected behavior of high n Ach people.

Marginality. Research Hypothesis 3c stated that marginality will affect time in the monitor, disturbance handler, and resource allocator roles.

In the univariate analyses, marginality was not related to the monitor role. However, individuals with high marginality did spend more time in the combination of resource allocator and disturbance handler roles which was consistent with theory.

Consistent with the univariate analysis, in the regression results on monitor, marginality was not significant. Contrary to the univariate results, marginality was not significant in either the resource allocator or the disturbance handler roles. Thus, it appears that marginality may not be related to any of these roles.

In examining the regression results overall, marginality was significant only in the regression on the disseminator role. In this regression, those whose marginality was indeterminate spent more time in this role than the marginal or non-marginal managers.

## CONCLUSIONS

The conclusions drawn from this research and its predecessors are presented for each Research Objective. The first Research Objective is examined from three different perspectives. First, the overall methodology of this study is examined. Second, conclusions regarding the

existence of roles and how managers distributed their time in these roles are presented. Finally, conclusions regarding the effect of organization variables are presented.

The first Research Objective was in essence the replication of previous research. Research Objective Two and Three broke new ground. Research Objective Two was designed to detect differences between how private and public managers allocated their time among the roles. The third and final Research Objective was to determine the effect of personal variables on how managers distributed their time among the roles.

#### The Replication

This section of the conclusions reports on the methodology, roles, and effects of organization variables.

Methodology. Perhaps the main methodological issue of this research was the mapping technique. Mintzberg (1973) observed the behavior of five CEOs for two weeks. Based upon this observation period, he devised his ten roles that included specific observable behaviors and interactions. Additionally, Mintzberg recorded certain verbal contact categories. Adcock then took the discriminating characteristics of each role and combined them with the verbal contact categories to map observation to a specific role. The observations were self-reported using the Management Activities Form. This mapping step was taken to develop

an efficient process of sampling managerial behavior. In this study, all activities mapped to the leader role were further subdivided into either the task leader or relationship leader role. In the end this particular split did not contribute anything to the research. The correlation between the leader and task leader roles was 0.924. The independent variables representing leadership orientation provided adequate information on the effect of leadership orientation without subdividing the leader role.

Some difficulties resulted in the mapping due to some roles not being mutually exclusive. Thus, some activities were mapped to more than one role while others were mapped to only one role instead of to possibly multiple roles. An example is the mapping of informational exchanges between a respondent and a peer or outsider to either the monitor or spokesman role. One could argue that in fact the exchange is for liaison purposes rather than informational purposes. Of course, the only individual who can answer such a question is the respondent. Likewise, some of the multiple mappings were somewhat arbitrary.

The review category was especially subject to arbitrary mappings. Some modifications to the Management Activities Form could eliminate some of the arbitrariness. For example, a post-meeting review between a respondent and subordinate mapped to the monitor and disseminator

roles. One could place two entries under post-meeting on the Management Activities Form - giving or receiving information - and eliminate the arbitrariness. A similar entry could be made for contact reviews, post-meeting reviews with non-subordinates, and functional reviews with outsiders to clarify the mapping to the monitor or spokesman roles.

Overall, the mapping technique was successful. The technique duplicated Mintzberg's work as closely as possible. Thus, it provided a good test of Mintzberg's work. Some refinements to eliminate certain arbitrary decisions could have further improved the technique; however as more entries are required of a respondent, one risks losing a respondent's full participation and cooperation. The simpler the method, the better is the guiding principle.

Sample selection also was an important aspect of this type of research. One had to insure that the sample was mature, i.e., experienced in the job and organization. In this sample, three individuals had less than six months experience at the ALC. This was undesirable and may have affected the results somewhat. Any future study using this methodology should use respondents with at least six months experience in the organization. Also, there were five respondents who had less than six months experience in their current position. If they were in the same primary type of work prior to entering their current position, this may not have adversely affected

the results. If not, the results may not have been indicative of what managers normally do at an ALC.

The data collection procedures were an integral part of the methodology. A modified activity sampling methodology was used. The modification consisted of having the respondents rather than an observer record their activities. Integral to the success of this method was insuring that the respondents understood the procedures and terms used. The procedures used in this study were very successful as shown by the study's validity. This procedure should be used in all future undertakings adopting this methodology. An initial meeting with respondents to explain the terminology and procedures with a follow-up meeting after one day of actually signaling the respondents worked very well. To further insure understanding of the terms and procedures, periodic reports of errors were sent to all respondents. If a respondent was consistently making an error, a note was sent to the individual through the intermediary to insure correction and anonymity.

Respondents initially had difficulty with the definition of the words strategy and review as they did in Adcock's study. One must take care that the respondents understand these two activities can only occur in meetings. Again this follow-up meeting procedure worked very well as substantiated by this study's validity and its decreased error rate (6.4%) when compared to Adcock's (12.4%).



In both meetings, respondents requested directions about what to do if signaled and not doing managerial work. The answer was to not respond. In future studies, the Management Activities Form should be modified to include a non-managerial entry in the 'Doing What' subcategory. This would remove this uncertainty in the minds of respondents and provide additional information upon which to perform the validity checks.

There was one deficiency in the data collection procedure. Twenty-seven respondents participated in this study with an average of 123.9 valid responses per individual and a range from 43 to 212. The original goal of the research was to have an average of 200 responses per individual. Due to funding limitations the study had to be terminated before 200 responses were reached. Though the total sample size of 3346 was adequate, a larger sample was desired.

The use of pocket pagers to signal respondents was very effective. However, this study did not set a minimum time between signals. Thus, on a few occasions individuals would receive signals only one or two minutes apart. This occasionally served as an irritant to some respondents. In future studies, signals should be constrained so as to occur to an individual no less than five minutes apart.

Overall, the methodology is excellent. The modified activity sampling methodology is efficient and allows collection of large amounts of valid data over a relatively short period of time when compared to observation. Some mappings are somewhat arbitrary and could be improved. However, the validity check confirmed the adequacy of the mappings overall.

The roles. Research Objective 1a was established to verify that government/military managers do act in all eleven roles (Mintzberg's ten and Adcock's subordinate role) and to estimate the proportion of time spent in each role, thus verifying that Adcock's methodology detects all eleven roles.

The results of this study showed that the respondents did in fact act in all eleven roles. Mintzberg's ten roles did exist as did Adcock's subordinate role. Thus, Adcock's methodology successfully detected all roles. However, the low split-half reliability scores for the negotiator and liaison roles cast a shadow over the results for these roles. Since the split-half reliability score for these roles in Adcock's study were adequate, one can conclude that all eleven roles existed and were captured by the methodology if one assumes the low reliability scores were an anomaly of this study.

One can take these specific conclusions and extend them further. To understand managerial work, one must

have a method of capturing and understanding what managers do. The roles identified in this study are in fact based upon specific managerial activities or work. The content of managerial work has been successfully placed into a role concept that provides a base for examining the effect of various contingency variables on managerial work and a framework to further understand job content. No longer must management theory rely on such nebulous concepts as planning, organizing, staffing, and directing. The work activities school of management has been successfully operationalized in a conceptual framework.

Finally, Mintzberg's classification of roles into the informational, decisional, and interpersonal groupings and including Adcock's subordinate role was successful. This scheme successfully captured the managerial activities performed in this sample. Thus, this study supported the appropriateness of these roles to public sector managerial work. Since the managers spent some time in each of the roles, Mintzberg's role concept was confirmed.

Organization variables. Research Objective 1b was established to determine the contribution of four organization variables examined by Adcock to the variability in how the government/military managers distributed their time in roles.

Within the theoretical framework of this study, it was argued that organization variables would affect

the behaviors of managers. Specifically, in this study the effects of hierarchical level, line versus staff, span of control, and number supervised were examined.

Consistent with theory, hierarchical level did affect the time managers spent in the figurehead role. Lower-level managers did spend less time in this role than their higher-level managerial counterparts. The results of this and Adcock's study did not agree perfectly though. This study found that the middle-level managers spent more time in this role than the lower-level managers but the top-level managers did not. The difference between the two studies can be explained by the difference in the samples. This study sampled all levels of management while Adcock sampled only lower- and middle-level managers. Since each study divided the managers into three levels, the two studies are not directly comparable in this respect. The fact that middle-level managers in this study spent more time in the figurehead role can be explained by the number of ceremonies in which middle-level managers must participate. In fact, the middle-level managers of this study may be more comparable to the top-level managers in Adcock's study. If this is the case, then both studies had the same results meaning that, in fact, during work hours mid-level managers do spend more time in the figurehead role than do top-level managers.

Hierarchical level also affected time in the leader role. Mid-level managers spent more time in this role than the lower- or upper-level managers who spent roughly the same time in the leader role. As will be seen in the later discussion on leadership orientation and the leader role, this role is, to a great extent, defined by activities requiring initiating something, following-up, investigating, and acting. Basically, these are activities to 'get things done'. This is somewhat consistent with what Tosi and Carroll (1976) state middle-level managers do. Likewise, the results support the findings that middle-level managers are generally higher on n Ach than managers at other levels since these activities can be associated with the mid-level managers acting to get things done for the satisfaction they obtain.

Hierarchical level also affected time in the spokesman role. Mid-level managers spent more time in this role than low-level managers while top-level managers spent less time in this role than low-level managers. Though this may sound contrary to theory, it is not necessarily. The activities mapped to the spokesman role consisted of providing information to those outside one's unit. Thus, it appears that the mid-level managers spent more time doing this than did the low-level managers; however, the top-level manager's unit was defined as all those working for him, and apparently he spent less time providing

information outside his unit than his subordinates whose units were smaller. This result may also mean that the top-level managers are more involved in internal operations than theory predicts.

In examining hierarchical level, it is interesting to note that when hierarchical level has an effect on time in a role, the mid-level managers always spent more time in the role than did either the low- or upper-level managers. Thus, these results indicate that some very specific roles and their associated skills are required by mid-level managers. Specifically, mid-level managers must possess skills associated with the figurehead, leader, and spokesman roles. Individuals entering mid-level management then should either possess these skills or should be provided the necessary training to perform adequately. Since different skills are required of mid-level managers than lower-level managers, success at the lower levels may not equate to success at higher levels. Additionally, the results for the three roles may indicate that each level gets more involved in those actions normally believed to be within the purview of the next lower level, i.e., micro-managing occurred. This may also indicate that top management is not dealing with its environment and setting policy as it should. One must question whether top management really prefers addressing strategic issues using their conceptual skills approach

or if they prefer operational issues requiring technical skills instead.

Functional area of expertise was theorized to affect the time managers spent in various roles. This was the case for the disseminator, entrepreneur, and resource allocator roles. The staff managers spent less time in the disseminator role than did the line managers. This was not as anticipated. It was theorized that the staff would spend more time in this role. However, it is possible to explain this particular result. Staff personnel might be expected generally to be heavily involved in advising line personnel, however passing information internally maps to the disseminator role. One could reasonably argue that line managers must provide more direction, guidance, and information to their workers than do staff managers. Furthermore, one can argue that staff managers undertake tasks independently and autonomously seek out the information they need to do these tasks. If this were the case, then one would argue that staff managers spend more time in the monitor role, which they did not. So the findings here are unclear though they appear to indicate that line workers and managers require more information passed internally than do staff managers who appear to work more independently.

Staff managers spent more time in the entrepreneur role than did line managers. Thus, the staff took the

initiative more frequently to improve the organization. Specifically, certain strategy meetings and all functional reviews mapped to the entrepreneur role. Due to the nature of the Directorate of Materiel Management (staff), many functional reviews are held. Thus, this result seems to fit the organization sampled. Simply speaking, the results indicate that the staff managers are involved in more meetings that map to the entrepreneur role than are line managers. Since many key decisions are made in activities (meetings) mapping to the resource allocator and entrepreneur roles, these results imply that key organizational decisions are made by staff functions rather than line managers as Mintzberg and other theorists implied. Though line managers must make decisions, their decisions may be done less formally and, once made, directed through action requests so this mapping procedure may not capture these day to day decisions.

Finally, staff managers spent more time allocating resources than did the line managers. This role consists of authorization and appointment requests as well as strategy meetings dealing with operational planning, budgeting, resource allocating, or target setting. Here the Directorate of Materiel Management is deeply involved with such meetings on a regular basis throughout the divisions. Again, the directorate is heavily involved in coordinating when aircraft and missiles receive overhaul



and modifications. Likewise, the directorate works heavily with planning for modification programs and examining budget requirements and target dates. The findings seem to fit the organization.

Span of control was another variable examined in this study. This variable was found to affect time in the figurehead, leader, task leader, monitor, entrepreneur, and resource allocator roles. Without doubt, this variable affected time in more roles than any other variable examined in this study. Not only was span of control the most pervasive, but also the results were the most consistent and logical. For the leader and task leader roles, time in the roles increased as the span of control increased. With more first line subordinates, the managers logically spent more time in the leader role. Likewise with more immediate subordinates, the manager may not have as much time for relationship-oriented activities. Instead he spends more time as a task leader defining tasks and providing direction.

For the figurehead and resource allocator roles, those with the largest spans of control ( $\geq 7$ ) spent more time in these roles. This is relatively easy to explain. More time was spent in the resource allocator role since the supervisor was faced with more requests for authorizations and appointments due to the increased number of individuals reporting to him. The explanation

for the figurehead role is not as easily explained but two possible explanations do exist. If a manager has a larger span of control, one can argue that he has more areas of responsibility under his control than other managers. Thus, he may find himself involved in more ceremonies. However, a more plausible explanation is that he will receive more requests for influence from outside his area due to his increased status and area of responsibility.

For one role, monitor, time decreased as the span increased. This is not a surprising result. As a manager finds himself with more subordinate areas of responsibility, he may have to act more on requests than listen to information. This does not imply the manager is not receiving information because he always is, but rather it simply states that other activities besides receiving information seem to predominate.

The last organization variable for which specific conclusions can be drawn is the number supervised (the total number of subordinates). This variable affected the figurehead, monitor, and disturbance handler roles. Time in all these roles increased as the number of subordinates increased. For the figurehead role one can logically argue that as the number supervised increases, one spends more time in ceremonies. As the number supervised increases, one would logically argue that

more conflicts between subordinates would occur and one would spend more time in these roles. Finally, one could also logically argue that as the number supervised increases one would spend more time receiving information from subordinates. This may appear to contradict span of control results regarding the monitor role, but this is not necessarily the case. If one has a large span of control, one has many immediate subordinates and may have less time for listening and need more time for acting. A large span of control does not necessarily equate to a large number of subordinates. Generally, as one goes up the hierarchy one has more subordinates. Thus, one may spend more time listening to them as one conducts his daily activities. If this were true, hierarchical level should have been significant for the monitor role; however, the high multicollinearity between hierarchical level and number supervised probably obscured the effect of hierarchical level on the monitor role.

In summary, the organization variables did have an effect on time in roles. Span of control had the most pervasive and logical effect of all the organization variables affecting the figurehead, leader, task leader, monitor, entrepreneur, and resource allocator roles. Hierarchical level affected time in the figurehead, leader, spokesman, and resource allocator roles. It is believed that hierarchical level may have had even

a wider effect except that its correlation with number supervised obscured its actual effects. The strongest effect of hierarchical level was its impact on the figure-head role. The number supervised affected time in the figurehead, monitor, and disturbance handler roles. Again, it may have had a wider effect if it had not been so highly correlated (0.47) with hierarchical level. Finally, line/staff affected time in the disseminator, entrepreneur, and resource allocator roles. This variable may have had wider effects too if it were not for its correlation (0.47) with span of control.

The effects of the organization variables were demonstrated in this and previous studies. In fact, Mintzberg's notion that different jobs would require different roles was supported. These variables are easily identified with particular managerial jobs. It would be wise then to identify managers with specific skills for specific jobs. If this is impossible, then organizations should provide the necessary training. This training could be devised on a job rotation basis so as to have managers work in parts of the organization with varying spans of control and different functional areas. This would develop the various skills of the various roles and prepare managers for a variety of jobs. Of course, much still needs to be done to identify the effects of various input variables on managerial role behavior.

The results of this study regarding organizational variables are not in complete agreement with some previous studies. Cummings and Berger (1976) identified seven organizational variables examined extensively in the management literature which had no significant effect on managerial behavior. Four of those variables were studied in this research and all four were found to significantly affect managerial behavior. In examining the results of various studies of managerial behavior, it is difficult to draw specific generalizable conclusions due to sample or methodological differences in the studies. For example, the different results of this and Adcock's study may be explained by other input variables excluded in both studies. The sample in this study came from a much larger organization than did Adcock's sample. The overall size of the organizations may have affected the behavior of the managers. Generally, larger organizations are viewed as more formalized, standardized, and less personal. At this point, organization variables do affect managerial behavior, however, the size of the organization may have impacted behavior. Likewise, the multicollinearity in both studies confounded the results. Due to the fact that multicollinearity was not nearly as great in this study as in Adcock's study, this study's results could be considered more indicative of true managerial behavior.

### Private versus Public

Research Objective Two was established to examine if there were any differences between private (Adcock's sample) and government/military managers regarding their role behavior.

The statistical results of this study appear to lead to the conclusion that public and private managers behaved differently. However, closer examination of the statistical results reveals that the largest contributions to the test statistic came from the variables whose reliabilities were the lowest. Comparing the results of the studies using only the variables whose reliabilities were clearly acceptable leads to the conclusion that no difference existed between the two groups of managers. Previous generalizations stating that management in the two sectors is different appear unfounded. Instead Mintzberg's contention that all managerial jobs are relatively alike is the conclusion drawn here. In fact, it appears that the role skills required by a manager can be transferred across the two sectors. Management is management.

### The Effects of Person Variables and Combined Effects

Research Objective Three was designed to primarily examine the effects of selected person variables and combined effects on how managers distributed their time among the roles. Conclusions regarding each are presented below.

Person variables. Overall the results for the person variables were disappointing. It was anticipated that these variables would impact time in the roles more than the results indicated. It appears instead that the organization variables controlled the distribution of time among the roles. However, what may have happened was that the effects of person variables acted through or were confounded by the organization variables. It is still entirely possible that individuals with specific personality traits tend toward specific organizational positions. Thus, the organization variable is significant in the statistical analysis while the person variable is not or neither is significant. The other plausible explanation is that managers very well may not have much control over their time.

Marginality only affected time in the disseminator role. Those managers (two) who were indeterminate in marginality spent more time in this role than either marginal or non-marginal managers. The conclusion drawn here is simply that marginality did not affect time in any role and the result for the disseminator role was an anomaly.

There are several plausible explanations for why marginality had no effect on time in the multivariate analysis. First, in the univariate analysis, marginality did have an effect. The univariate test was less rigorous

but it did show that marginal individuals spent more time in the combination resource allocator and disturbance handler roles. The argument for a relationship between marginality and these two roles was that marginal individuals tend to be more open-minded and more able to view various sides of disagreements. Thus, their abilities would lend them more capable of handling situations where conflicts occur, such as in allocating resources or handling disturbances. This may be true; however, the results of this study indicated that other factors may have a greater effect in determining who handles these situations. It is possible that other skills or abilities determine who is assigned jobs highly involved in handling disturbances and resolving disturbances. The ability to approach problem situations systematically and logically may impact the disturbance handler and resource allocator roles more so than marginality. Thus, the results do not mean that marginality had no effect but that the effect was not totally uncovered in this study since the effect of marginality may have been confounded by more dominant personal abilities.

Leadership orientation was also examined in this study and found to affect the figurehead role. Relationship-oriented leaders spent more time in the figurehead role than others. This is not unexpected since the figurehead role consists of ceremonial activities which a relationship-oriented person may do more frequently than other



managers. Quite simply this means that managers who are relationship-oriented spend more time in ceremonies recognizing their subordinates than do task-oriented managers. The failure of leadership orientation to be significant in any of the other roles can possibly be explained. One's leadership orientation does not necessarily become immediately apparent during normal day-to-day activities of the manager. Instead, the task-leader operates in a mode generally similar to other managers until placed under duress. The manager's task-oriented nature may only appear in his behaviors when he is under stress. Thus, leadership orientation was not generally significant. All behaviors mapped to the leader role were subdivided to either the task leader or relationship leader role. These submappings may have been erroneous and contributed to the failure to find more significant results for the subroles. Either the behaviors mapped to each leader role were not correct or the task-orientation of certain managers did not appear because they were not generally placed under enough duress for behaviors to change. There is another plausible explanation. Leadership is a very broad, all pervasive concept. One's leadership style permeates practically each and every action one undertakes. Thus, it may be that no mapping procedure will satisfactorily capture leadership styles.

The final person variable examined was  $n$  Ach. This variable affected time in the leader, task leader, and disseminator roles. These results are both consistent and logical. The literature states that individuals with high  $n$  Ach have little time for people. This was supported. As  $n$  Ach increased, the manager spent less time in the leader and task leader roles. Also, managers with high  $n$  Ach spent more time in the disseminator role than others. The high  $n$  Ach manager finds himself providing more information and guidance than others. The results for  $n$  Ach provide some interesting results when examining them regarding the task leader and leader roles, which due to their high correlation are considered the same, and the disseminator role. Individuals with high  $n$  Ach are generally believed to desire getting things done for the reward of personal satisfaction. Thus, the high  $n$  Ach manager is constantly providing guidance and direction to his subordinates to insure task completion. As tasks are completed, he feels his reward, self-satisfaction. He, however, has little time for those activities associated with the task leader - requests to initiate something, to investigate, to follow-up, and to act. His guidance is more general and his high  $n$  Ach characteristics are related to the disseminator role rather than the more formal entrepreneur role which occurs primarily in meetings.

In summary, the person variables did not affect the time in roles as extensively as was anticipated. Need for achievement was the strongest person variable and its affect was consistent and logical. Need for achievement decreased time in the leader and task leader roles and increased time in the disseminator role. In this study, activities associated with high n Ach were more closely in line with the disseminator role than the entrepreneur role as is generally thought. Thus, person variables may need to be rethought when discussing behaviors rather than concepts, i.e., when answering how the concepts are operationalized. Leadership orientation only affected time in the figurehead role with the relationship-oriented leader spending more time in this role. One point should be emphasized here. Span of control was the most significant organization variable and it had a high correlation (0.47) with leadership orientation. As span increased, leadership style moved from task-oriented to relationship-oriented. Had it not been for the inherent collinearity, leadership orientation may have been significant for more roles. Finally, marginality had no explainable effect on any of the roles. This may have been because it is confounded with other personality traits. This possible explanation is also supported by a correlation of -0.29 between marginality and leadership orientation,

i.e., as one moves from non-marginal to marginal one also moves from relationship-oriented to task-oriented.

As discussed in Chapter 2, there are many who believe that organization variables dictate behavior in an organization and that person variables have little effect. That seems to have been substantiated by this study. The job seemed to control the role activity more than the incumbent. However, it may be important to remember that leadership orientation and span of control were highly correlated, thereby obscuring the possible effect of leadership orientation. This particular correlation seems to support the notion that personal characteristics affect how one moves to and through an organization. Thus, the person variables may actually have a real affect but are obscured or confounded by the stronger effects of organization variables.

Combined effects. The only conclusion that can be drawn regarding combined effects is that high n Ach/mid-level managers do spend more time in the entrepreneur and negotiator roles than do all the others. This was as predicted. The hypothesis regarding marginality/first-line supervision were not rejected. Several different explanations exist. First, the hypotheses were based on literature primarily dealing with first-line foremen. These hypotheses dealt with first-line supervisors both in staff and line positions. What is true of foremen

may not be true for first-line staff supervisors. Also, when dealing with foremen in industry, one usually faces a union 'we/they' attitude. This is not the case in the organization sampled. Though a union existed, it did not have the same power as unions in the private sector. Finally, the previously discussed problems concerning the definition of line and staff could have affected these results.

#### Implications for Management

Overall, the findings from this study do have some important implications for both the practitioner of management and the student of management.

One factor of significance to the practitioner is the importance of the informational roles. Approximately 67.0 percent of the managers' time was spent in the informational roles, with the monitor role consuming 39.0 percent of the time. Obviously, information is vital to the manager. Any techniques that could be made available to assist managers in obtaining and processing information would be beneficial. Effective management information systems could be well worth the investment. In selecting individuals for positions where there are a large number of subordinates, organizations can look for managers who are adept at receiving, obtaining, and processing information. Alternately, organizations could provide training in these skills as managers move into these positions.

Also, it appears that line managers are required to disseminate information more than staff and that those managers with high n Ach seem to disseminate information more. Thus, an organization may find it advantageous to place individuals high on n Ach in line positions. Likewise, managers at the mid-level must serve as spokesmen more frequently than others. No doubt, training for managers in information processing and communication would pay dividends. Matching managers with specific skills in communication and information processing to positions requiring these abilities as identified in this research would be beneficial.

The managers also spent a significant amount of time in the leader role. Mid-level managers and those with large spans of control seem to occupy the leader role more than others. Thus, leadership training for individuals in these positions would be advantageous if an individual lacks these skills. As theory predicted, individuals with high n Ach have little time for people. Thus, high n Ach people would not be the best to assign to positions requiring predominantly the leader role. Thus, the results of this study are especially useful to practicing managers in the selection, assigning, and training of managers. Since the informational and leader roles consume approximately 80 percent of the managers' time, these roles should receive the most attention. Wherever specific

roles are required due to hierarchical level, functional area, span of control, or number supervised, organizations should assign managers with those role skills or required personality traits. If these skills are lacking, managers should be provided the necessary training. Also, individual managers should be aware that different jobs require different skills and should attempt to adjust as job changes occur.

The results of this research are also of importance to the student of management. First, Mintzberg's Contingency View of Management and his role concept were again verified using actual behaviors rather than perceptions. The ten roles identified by Mintzberg and Adcock's subordinate role exist. Time in these roles is not uniform, and the time distribution is affected by both organization and person variables.

Certain theoretical notions regarding the effects of organization and person variables were supported. It does appear that the organization variables have the major effect on how managers spend their time in the job. Span of control was the most significant of all the organization variables sampled. Person variables are not without impact although their impact did not seem to be as great as that of the organization variables. Need for achievement was the most significant person variable. Although the results of the person variables were not

generally significant, there were differences in effects on certain roles which can be useful in guiding future research. To date, very little empirical research exists on Mintzberg's role concept, especially on the effects of these person variables. The results of this and the previous study by Adcock do provide some empirical basis for future research in managerial role behavior.

Also of significance is the finding that the managers in this study and Adcock's study did not seem to distribute their time differently among the roles. This could imply that, simply speaking, management is management. Thus, certain skills should be taught future managers whether they go into the public or private sector. To the extent that no difference in management exists between public and private sector management, universal selection, development, and even appraisal systems could be developed for use in both sectors. However, both studies were limited to organizations whose missions were highly technical. Management may not be universally applied in other types of organizations, such as a non-technical, public service organization.

The fact that the methodology used in this research and Adcock's research was successful is very important to the theoretician and student of management. They now have a useful method of collecting data on what managers do within the context of Mintzberg's role concept.



The modified activity sampling methodology using the Management Activities Form has been successful and is efficient. This methodology combined with the results of this study and its predecessor lay sound groundwork for future research.

#### RECOMMENDATIONS

To date, only this study and Adcock's research have examined Mintzberg's theory using the modified activity sampling methodology. Thus, much more research is needed in this area. First, none of the organization or person variables included in these two studies should be eliminated from further examination of their effect on the time managers spend in roles. All the variables appear to have some relationship to at least some of the roles.

Since both of these studies have examined managers involved in rather technical organizations, further studies in these and other types of organizations should be conducted. This would assist in controlling other variables that could affect the results and in comparing results. The Air Force have five major ALCs. This study should be replicated in one of the other ALCs, increasing both the length of time sampled and the number of managers sampled. Another possibility would be to study other types of organizations. One could examine managers in a state government organization as well as in a non-profit, private service organization to determine if differences

exist between the two and between this organization and Adcock's organization. If differences are found, do the reasons lie in the environment or are they internally caused by organization or person variables?

Additionally, replication of this study should include all levels of management. One problem with comparing this study's results and Adcock's results dealt with hierarchical level. Adcock sampled middle- and lower-level managers, and divided this group into three categories for analysis. This study actually included all levels of management. Thus, if this study is replicated in another organization, private or public, all levels of management should be included. If all levels cannot be included, then hierarchical level should be defined as low-, mid-, or upper-level on an absolute scale rather than relatively within the particular sample.

The studies to date have been descriptive in nature and have excluded consideration of performance. It may be appropriate at this point, since the activity sampling methodology has been validated, to examine effectiveness within this framework. Not only are researchers concerned with what managers do, but they must also examine what differentiates the effective manager from the ineffective one. This information then would be very useful in selecting, training, and promoting managers to increase organizational effectiveness. For example,

NO-0167 112

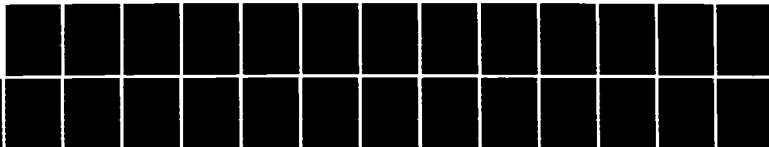
MANAGERIAL ACTIVITY ANALYSIS VIA MINTZBERG'S ROLE  
THEORY: THE EFFECTS OF.. (U) AIR FORCE INST OF TECH  
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AFIT/CI/NR-86-68D

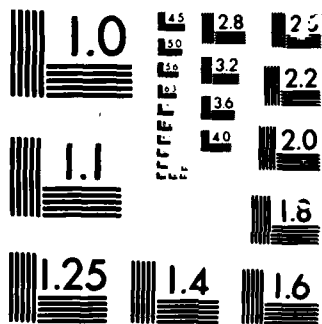
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in this study no difference was found in how managers distributed their time among the roles in the public and private sectors. From an effectiveness viewpoint, perhaps the time in roles should differ. Further research could determine what roles require different emphasis in different situations to produce organizational effectiveness. Although questions of 'effectiveness' raise a definitional issue, this is beyond the scope of this research and has not been considered further here.

Future researchers should continue to examine the effect of person variables on how managers distribute their time. Other variables such as dogmatism or locus of control could also be considered. Another variation might be to use broader personality measures. For example, Bright (1982) examined the effect of personality types on how managers emphasized Mintzberg's roles. He collected data on managers' perceptions of time spent in Mintzberg's roles using a questionnaire. Examining personality type using the activity sampling methodology could yield valuable information, especially related to the problem of marginality being seemingly imbedded or confounded in other psychological traits.

The modified activity sampling methodology has proven to be effective and should be used in future studies examining managerial behavior, contingency theory, and Mintzberg's role concept. However, certain adjustments

should be made to the procedure. Signals to individuals should be at least five minutes apart to preclude respondent irritation. Respondents should be thoroughly trained in the terminology and procedures prior to data collection. Initial and follow-on meetings should be held with written follow-ups sent as needed. The results of this study proved the value of this procedure. Future studies should not divide the leader role into a task leader and relationship leader role. The task leader role essentially equated to the leader role, and the relationship leader role was not significant. The effect of leadership orientation on the other roles should provide the information as to when a particular style is needed.

Also, the raw data from these studies should be made available to anyone replicating these studies. This would allow for more rigorous comparisons across studies. A center could be established to collect this data and make comparisons across all types of organizations. A central pool of data using established definitions and coding could be used to more thoroughly evaluate the Contingency View of Management within Mintzberg's role concept.

In conclusion, this research has provided valuable insights and has advanced the understanding of Contingency Theory and Mintzberg's role concept using an efficient modified activity sampling methodology. As a large data

base is generated for further study and as effectiveness is examined, researchers can determine if management in various types of organizations differ: public versus private, profit versus non-profit, small versus large, business versus educational, etc. Even more importantly, differences within these organizations between effective and ineffective managers can be uncovered. This knowledge then can be used to select, appraise, develop, and educate effective managers for the job.

APPENDIX A  
SELF-OTHER ORIENTATION INSTRUMENT



Number \_\_\_\_\_

The following questions provide an indication of the way you look at yourself in relation to other people.

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Below, a number of graphic figures representing yourself and other people are presented. Indicate for each situation that response which best describes your feelings about the situation.

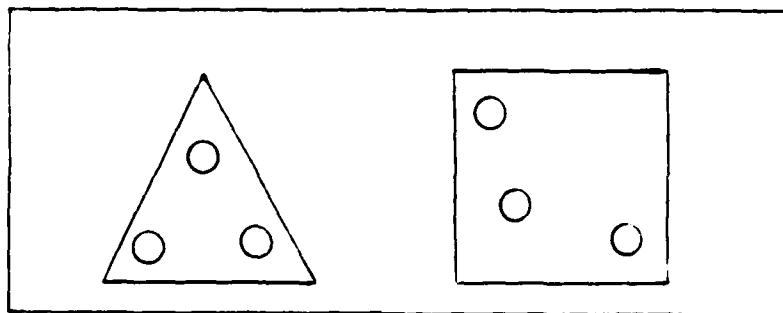
1. The circles below stand for people. Mark each circle with the letter standing for one of the people in the list. Do this in any way you like, but use each person only once and do not omit anyone.

D - Doctor  
E - Engineer  
F - Friend

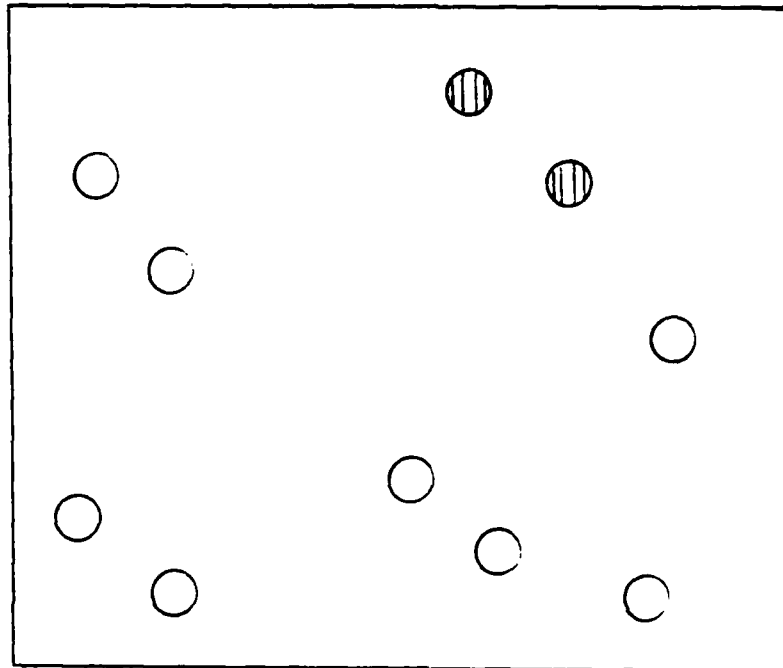
P - Politician  
S - Yourself  
B - Your Boss



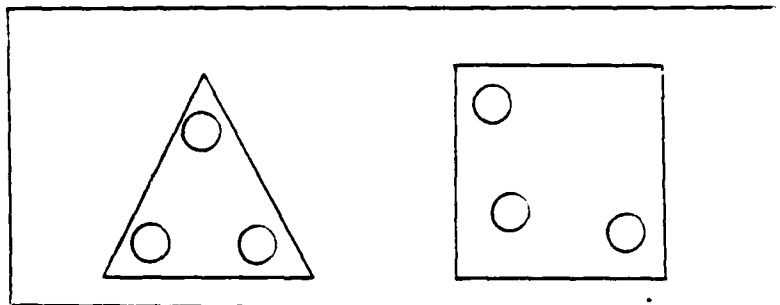
2. The triangle and the square each represent a group of people you associate with. The small circles represent other people within each group. Draw a circle S for yourself anywhere in the space below.



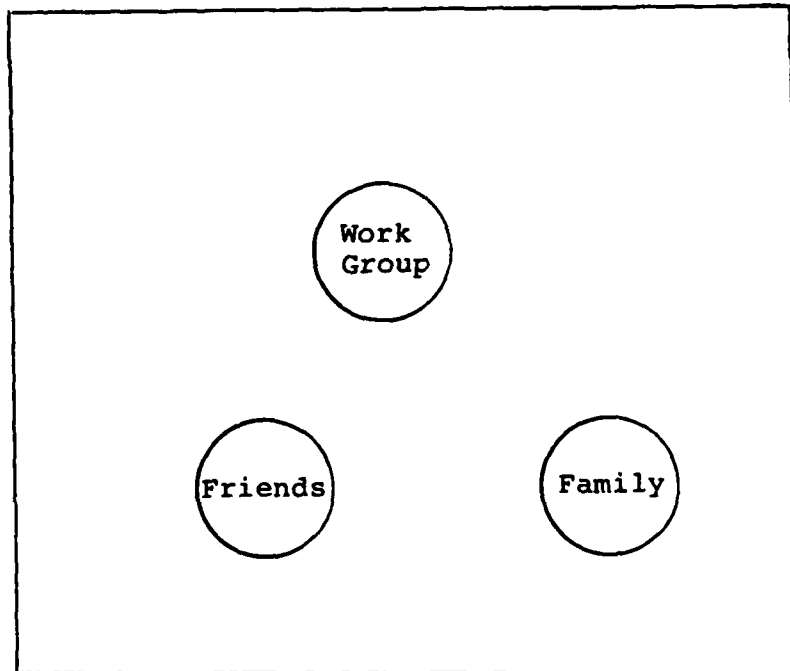
3. All the circles within the square stand for other people. Choose any one of the three circles on the right to stand for yourself, and draw one like it anywhere in the square.



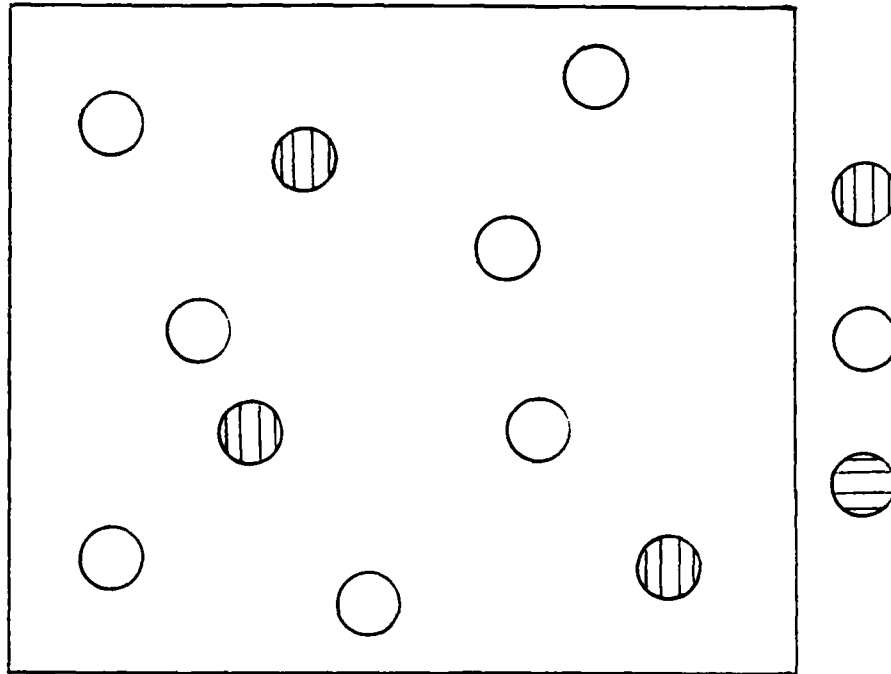
4. The triangle represents your employer and the square represents your customers. The small circles represent other people within these two groups. Draw a circle for yourself anywhere in the space below.



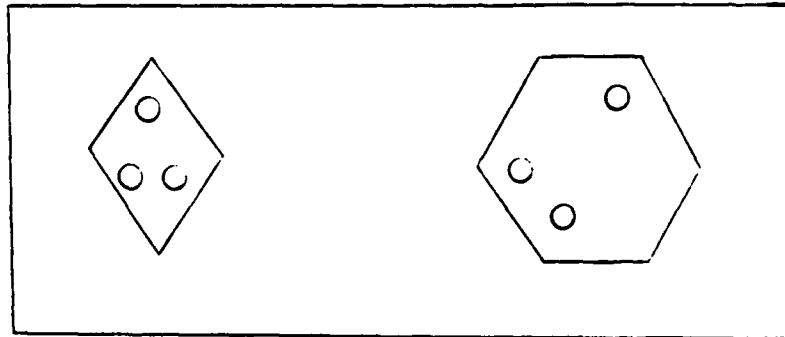
5. The circles below stand for your family, friends, and work group. Draw a circle (S) to stand for yourself anywhere in the space below.



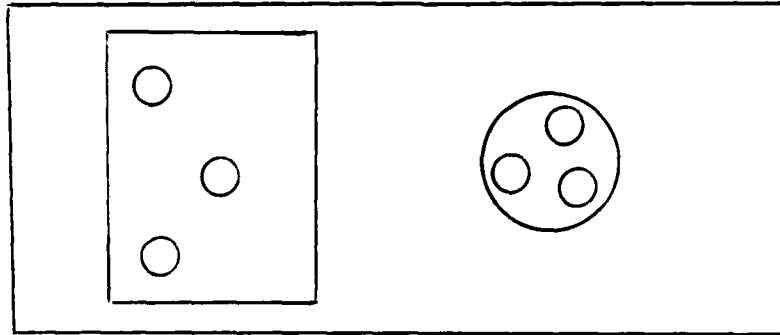
6. All the circles within the square stand for other people. Choose any one of the three circles on the right to stand for yourself, and draw one like it anywhere in the square.



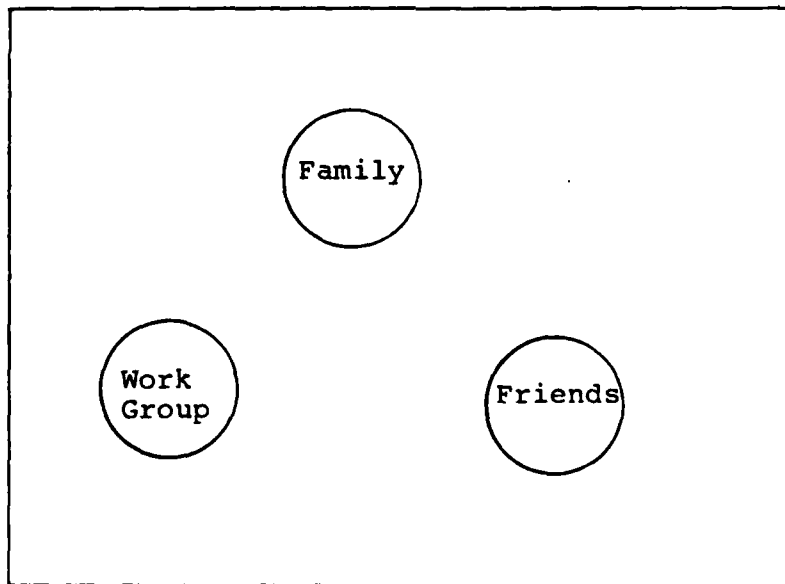
7. The two figures below represent two groups of people you associate with. The small circles represent other people. Draw a small circle for yourself anywhere in the space below.



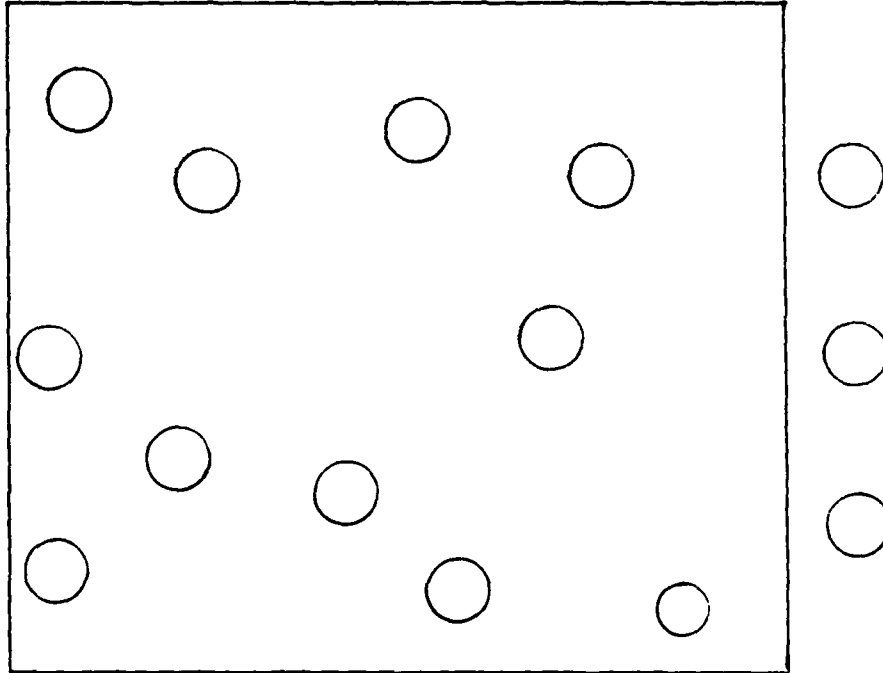
8. The circle and rectangle each represent a group of people you associate with. The small circles represent other people. Draw a circle for yourself anywhere in the space below.



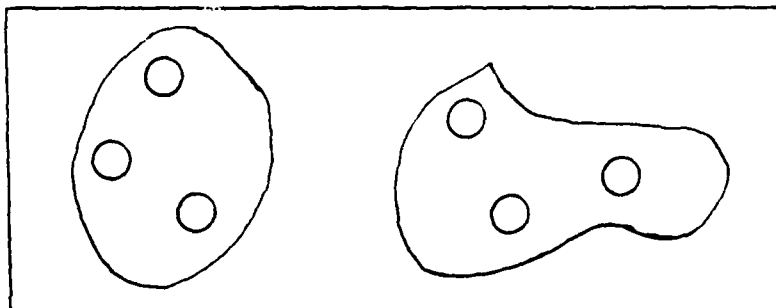
9. The circles below stand for your family, work group and friends. Draw a circle to stand for yourself anywhere in the space below.



10. All of the circles within the square stand for other people. Choose any one of the three circles on the right to stand for yourself, and draw one like it anywhere in the square.



11. The two figures below represent two groups of people you associate with. The small circles represent other people. Draw a circle for yourself anywhere in the space below.



APPENDIX B  
LEAST PREFERRED CO-WORKER INSTRUMENT





APPENDIX C  
ADJECTIVE CHECK LIST

### DIRECTIONS

This answer sheet contains a list of 300 adjectives. Please read them quickly and blacken in the space below each one you would consider to be self-descriptive. Do not worry about duplications, contradictions, and so forth. Work quickly and do not spend too much time on any one adjective. Try to be frank and fill the spaces for the adjectives which describe you as you really are, not as you would like to be.

USE A # 2 PENCIL DO NOT MAKE STRAY MARKS  
ERASE ERRORS COMPLETELY FILL THE SPACES COMPLETELY

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